

Recent Weather and Drought Conditions, the Latest on ENSO and the January-March 2013 Outlook For Colorado

Mike Baker
National Weather Service
Boulder, Colorado
December 22, 2012
Revised



A topographic map of Colorado showing elevation, major cities, and state boundaries. A semi-transparent dark red rectangle is centered over the state, containing white text. The word 'COLORADO' is written in large, spaced-out, orange letters across the top of the map. The text 'Recent Weather, Soil Moisture and Drought Conditions Across Colorado' is centered within the red rectangle in white. Various cities are labeled with a small '+' icon, including HIAWATHA, LARAMIE, KIMBALL, CRAIG, RANGELY, KREMMLING, STERLING, DENVER, WRAY, GRAND JUNCTION, FAIRPLAY, FLAGLER, MOAB, COLORADO SPRINGS, CHEYENNE WELLS, MONTROSE, DOVE CREEK, LAMAR, DURANGO, ALAMOSA, SPRINGFIELD, FARMINGTON, and TRINIDAD.

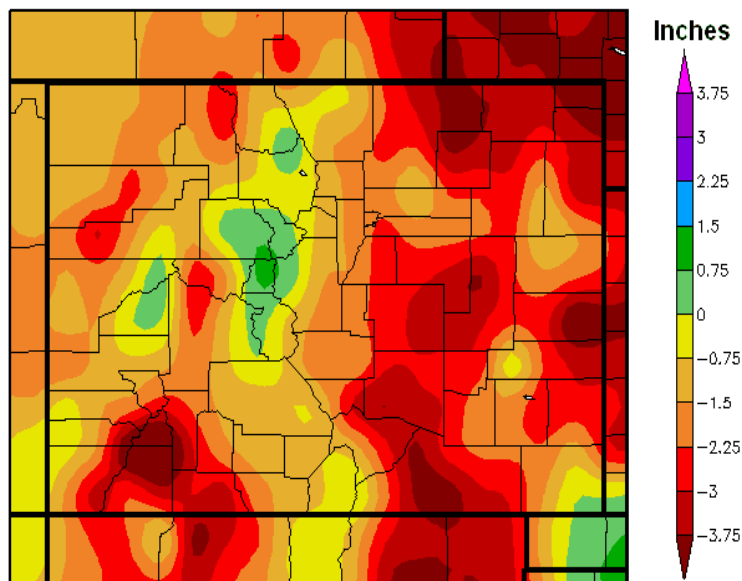
COLORADO

Recent
Weather, Soil Moisture
and Drought
Conditions
Across Colorado

During the
90-Day Period
September 22 to December 20, 2012

Precipitation for the 90-Day Period Ending December 20, 2012

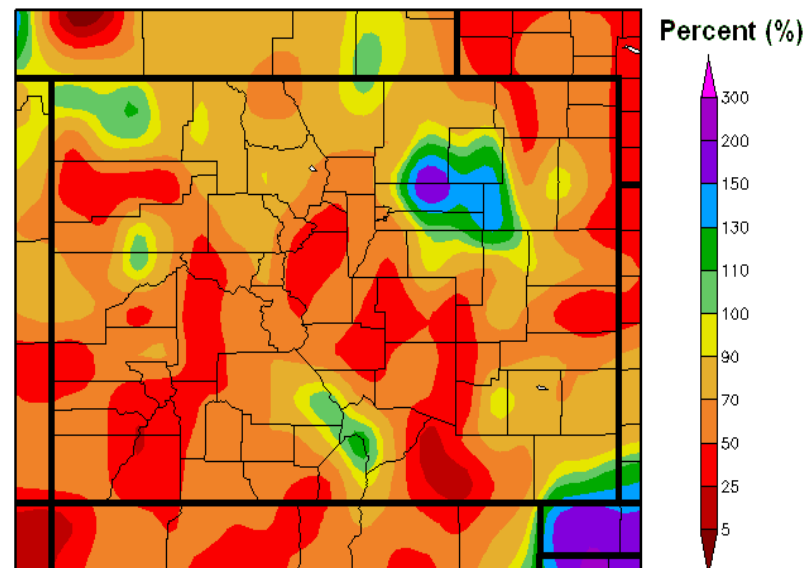
Departure from Normal Precipitation
for Colorado
September 22 to December 20, 2012



Generated 12/21/2012 at HPRCC using provisional data.

Regional Climate Centers

Percent of Normal Precipitation
for Colorado
September 22 to December 20, 2012



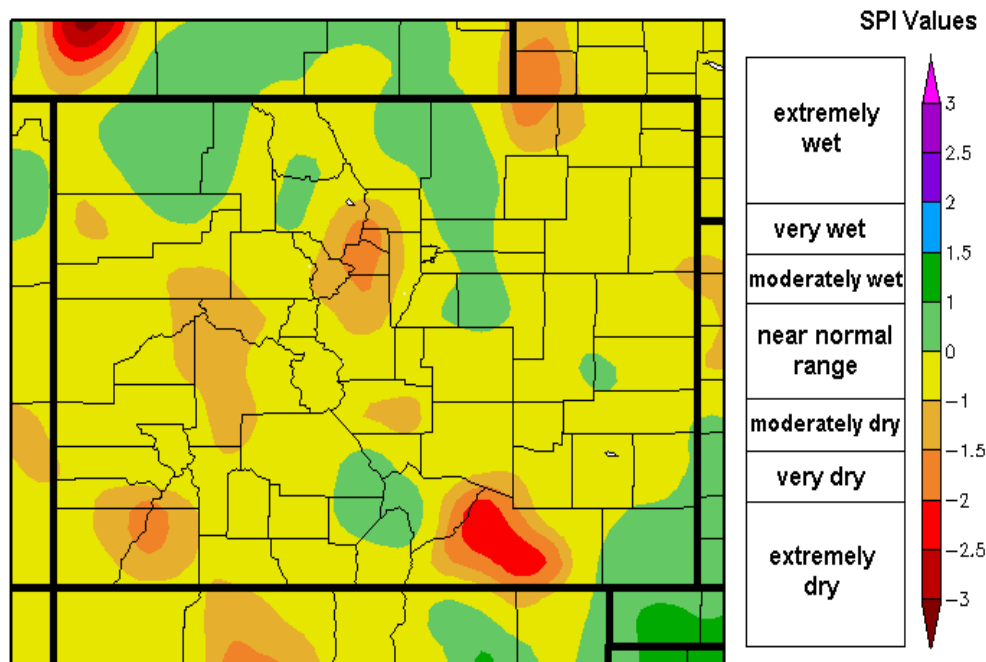
Generated 12/21/2012 at HPRCC using provisional data.

Regional Climate Centers

Other than scattered pockets of above to much above average precipitation east of Denver in northeast Colorado, in the extreme southeast corner of the state and on the west slope, precipitation overall during this recent 90-day period ranged from below to much below average across the Centennial State.

Soil Moisture Conditions for the 90-Day Period Ending December 20, 2012

90 Day Standardized Precipitation Index (SPI) for Colorado September 22 to December 20, 2012



Generated 12/21/2012 at HPRCC using provisional data.

Regional Climate Centers

The **Standardized Precipitation Index (SPI)** during this 90-day period indicates near normal soil moisture conditions for most of the Colorado. Exceptions include the oblong area of extremely dry soil conditions along the east slope of the Sangre de Cristo mountain range in southeast Colorado and a scattering of moderate to very dry soils across western and extreme northeast Colorado.

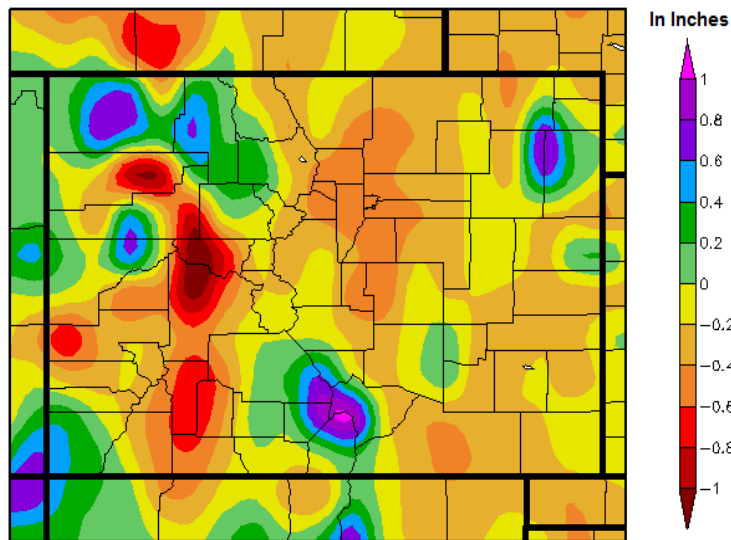
The **SPI** was developed to monitor potential short term agricultural and long-term hydrological drought conditions. The SPI is a probability index that considers only precipitation.

During the
30-Day Period
November 21 to December 20, 2012

Precipitation for the 30-Day Period Ending December 20, 2012

Departure from Normal Precipitation for Colorado

November 21, 2012 to December 20, 2012

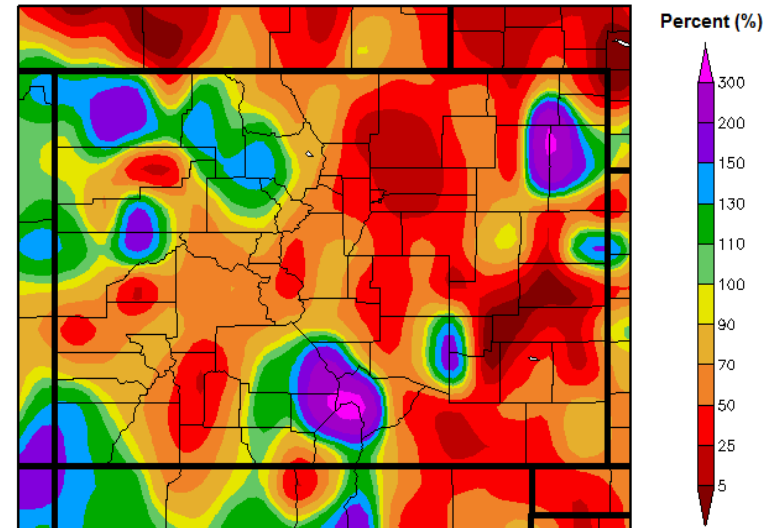


Generated 12/21/2012 at HPRCC using provisional data.

Regional Climate Centers

Percent of Normal Precipitation for Colorado

November 21, 2012 to December 20, 2012



Generated 12/21/2012 at HPRCC using provisional data.

Regional Climate Centers

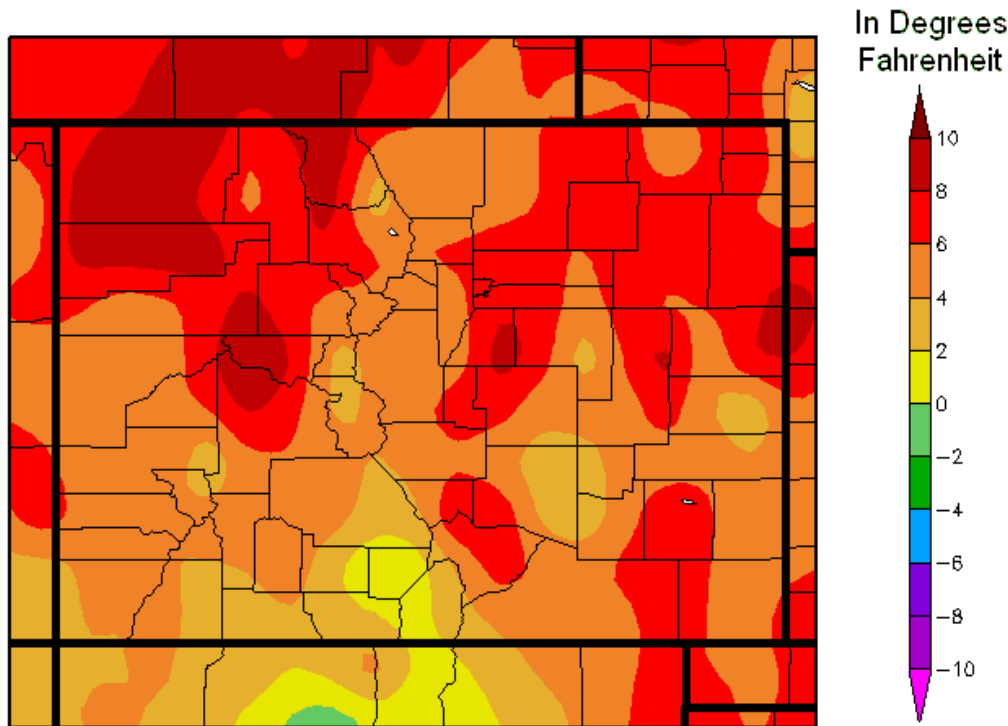
The above maps reveal a quilt work of above and below normal precipitation across Colorado during the recent 30-day period ending December 20, 2012. Overall, eastern Colorado continued to receive the least amount of precipitation, with a section of southeast Colorado receiving less than 5 percent of its normal allotment. At the same time, a few areas in eastern Colorado were fortunate to receive well over 150 percent of their seasonal average.

Western Colorado fared somewhat better, especially the northwest, the far southwest and south central parts of the state where a series of late autumn storms produced substantial precipitation in the form of snow. Precipitation in these areas ranged generally from 130 to around 300 percent of normal.

Temperature for the 30-Day Period Ending December 20, 2012

Departure from Normal Temperature for Colorado

November 21, 2012 to December 20, 2012



Temperatures across Colorado during the 30-day period ending December 20, 2012 continued to run above average. For the most part, temperatures across northern and eastern Colorado ranged from 4 to 10 degrees (F) above average, and from zero to 4 degrees (F) above average for the remainder of the state.

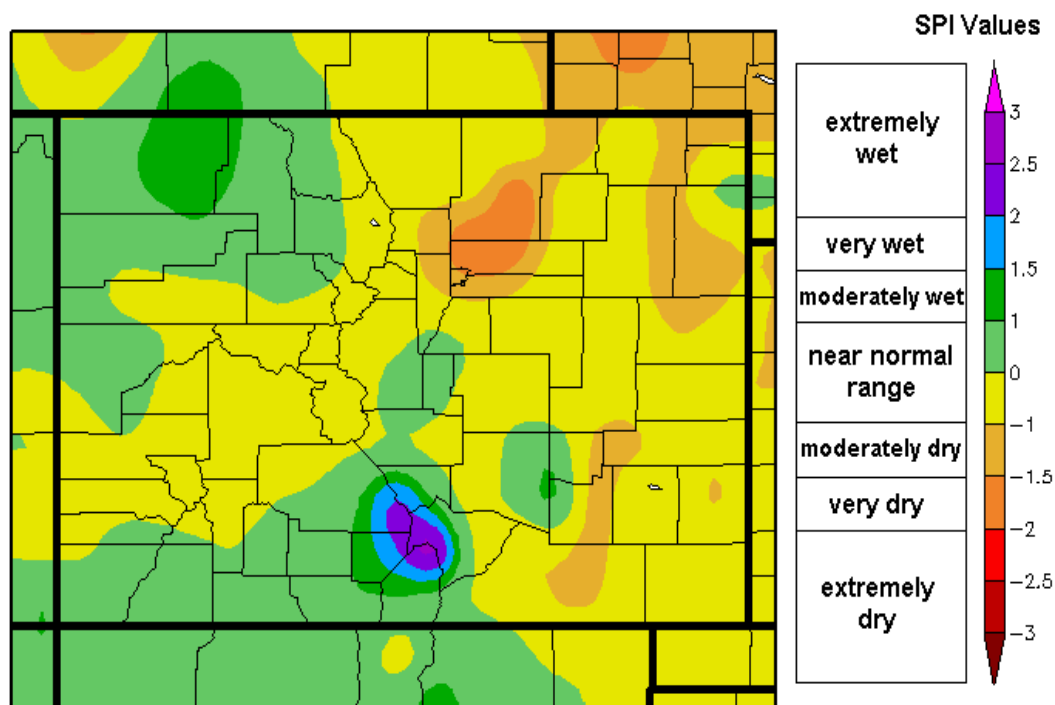
Generated 12/21/2012 at HPRCC using provisional data.

Regional Climate Centers

Soil Moisture Conditions for the 30-Day Period Ending December 20, 2012

30 Day Standardized Precipitation Index (SPI) for Colorado

November 21, 2012 to December 20, 2012



Generated 12/21/2012 at HPRCC using provisional data.

Regional Climate Centers

The **Standardized Precipitation Index (SPI)** indicated near normal to moderately dry soil conditions in eastern Colorado, with the exception of an elongated area of very dry soils north and east of the Denver metropolitan area.

The SPI also indicated near normal to moderately wet soils across western Colorado, and a pocket of extremely wet soil conditions in and near the San Luis Valley in south central Colorado.

U.S. Drought Monitor

Colorado

December 18, 2012

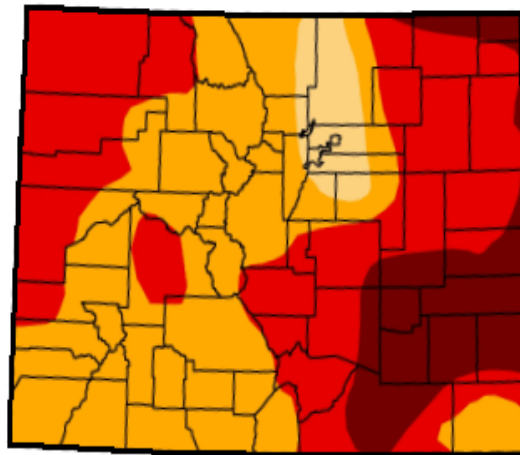
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	100.00	95.06	53.47	13.48
Last Week (12/11/2012 map)	0.00	100.00	100.00	95.06	53.43	13.48
3 Months Ago (09/18/2012 map)	0.00	100.00	100.00	100.00	61.75	16.89
Start of Calendar Year (12/27/2011 map)	67.79	32.21	24.98	14.94	0.04	0.00
Start of Water Year (09/25/2012 map)	0.00	100.00	100.00	100.00	61.75	16.89
One Year Ago (12/13/2011 map)	67.79	32.21	24.98	14.94	1.33	0.16

Intensity:

 D0 Abnormally Dry	 D3 Drought - Extreme
 D1 Drought - Moderate	 D4 Drought - Exceptional
 D2 Drought - Severe	



The Drought Monitor focuses on broad-scale conditions.
Local conditions may vary. See accompanying text summary
for forecast statements at the website below.

<http://droughtmonitor.unl.edu>



Released Thursday, December 20, 2012
Brian Fuchs, National Drought Mitigation Center

As of December 18, 2012, the U.S. Drought Monitor indicated extreme (D3) to exceptional (D4) drought conditions for much of eastern Colorado, and extreme drought conditions (D3) across the northwest corner of the state.

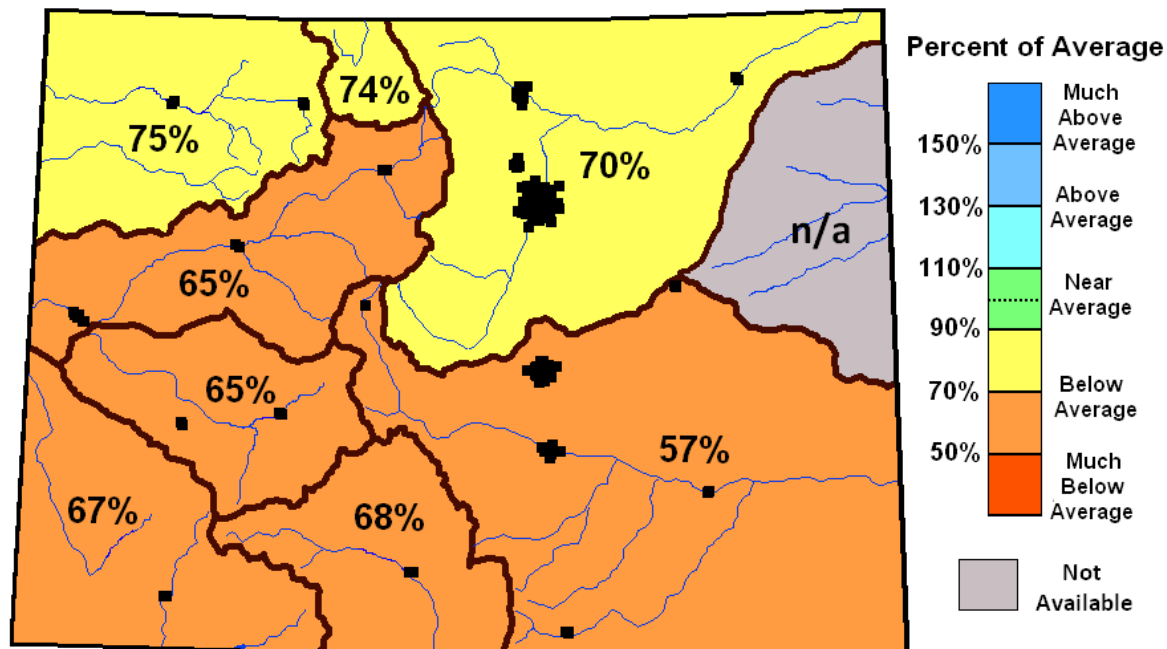
Furthermore, severe drought (D2) conditions were indicated across the southwest and along the spine of the Rocky Mountains. There was also an elongated area of moderate drought (D1) conditions on the state's northeast plains adjacent to the Front Range. This includes the greater Denver metropolitan area.

A grayscale photograph of a snow-covered mountain slope. A snowpack gauge is visible on the left side of the slope, partially buried in the snow. The gauge has a vertical pole and a horizontal arm. The snow is uneven, with some rocks visible. The background shows more of the mountain slope and some distant peaks.

Snowpack Across Colorado

As of
December 20, 2012

Colorado SNOTEL Snowpack Update Map



**Snow Water Equivalent as a Percent of Average (%)
for Colorado by River Basin as of Thursday Dec. 20, 2012**

Basin Wide Percent of Average (%)	
WEST SLOPE	EAST SLOPE
Yampa and White River Basins.....75%	Laramie & North Platte Basin.....74%
Upper Colorado River Basin.....65%	South Platte River Basin.....70%
Gunnison River Basin.....65%	Arkansas River Basin.....57%
San Miguel, Dolores, Animas & San Juan River Basins.....67%	
Upper Rio Grande Basin.....68%	
Statewide Avg....68%	

Source: USDA Natural Resources Conservation Service--Water and Climate, Portland, Oregon
provisional data, subject to revision

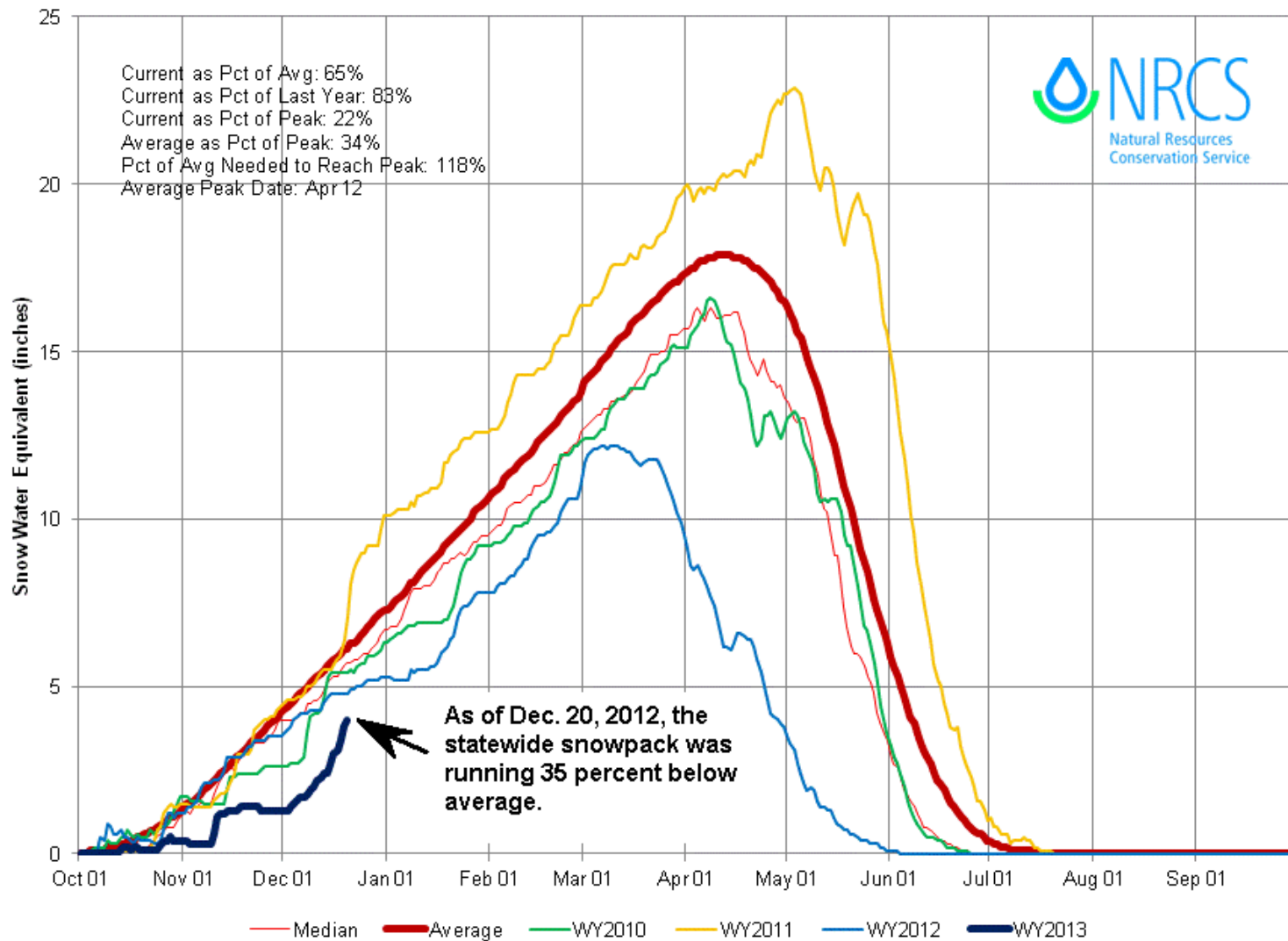
As of December 20, 2012, the Colorado snowpack continued to run below normal with a statewide average of 68 percent.

Northwest, southwest and south central portions of Colorado saw the greatest improvement in the snowpack, though not readily apparent from this map. A series of Pacific storm systems in late November and early December deposited a substantial amount of snow in these areas.

Meanwhile, the Arkansas River Basin in southeast Colorado continued to have the lowest average snowpack in the state.

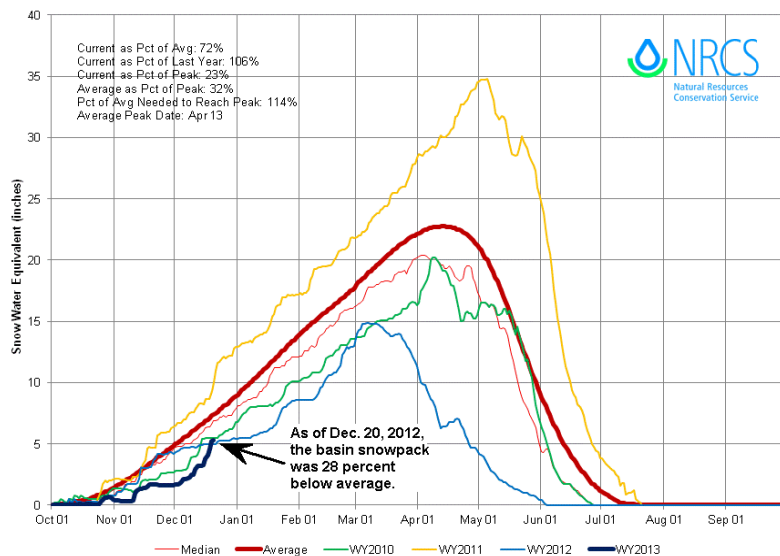
Colorado Statewide Time Series Snowpack Summary

Based on Provisional SNOTEL data as of Dec 20, 2012



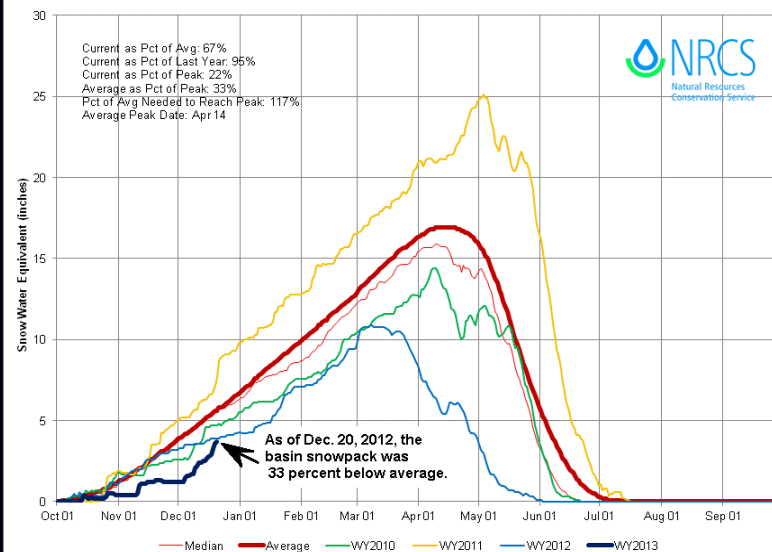
Yampa and White River Basins Time Series Snowpack Summary

Based on Provisional SNOTEL data as of Dec 20, 2012



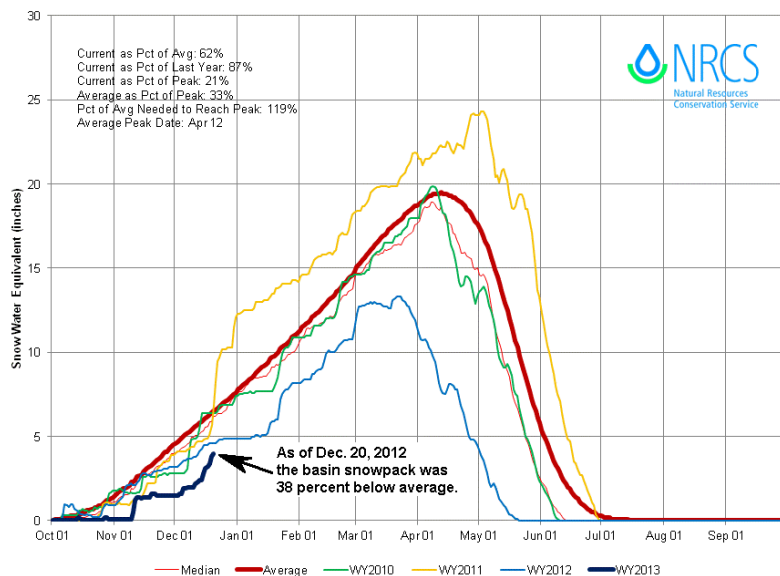
Upper Colorado River Basin Time Series Snowpack Summary

Based on Provisional SNOTEL data as of Dec 20, 2012



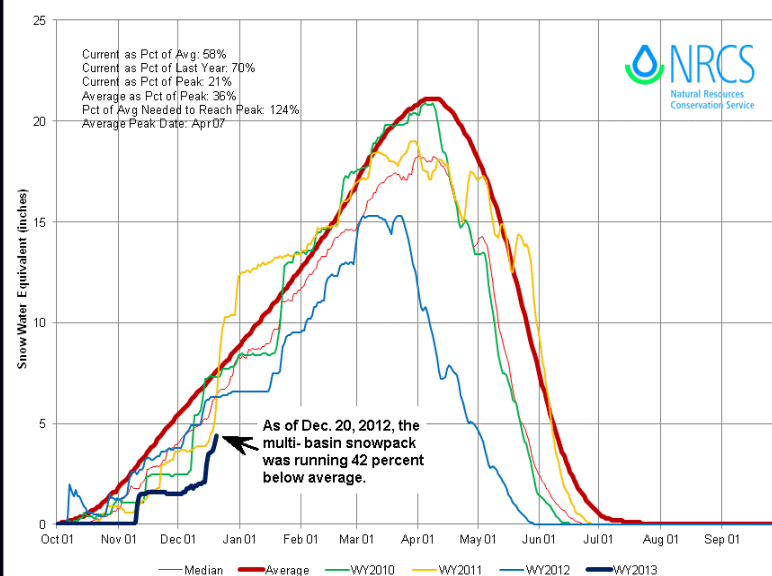
Gunnison River Basin Time Series Snowpack Summary

Based on Provisional SNOTEL data as of Dec 20, 2012



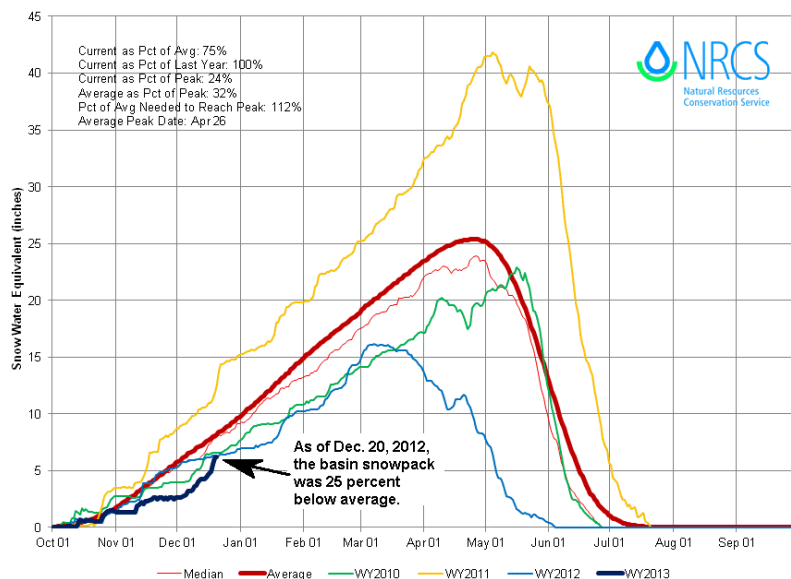
San Miguel, Dolores, Animas & San Juan River Basins Time Series Snowpack Summary

Based on Provisional SNOTEL data as of Dec 20, 2012



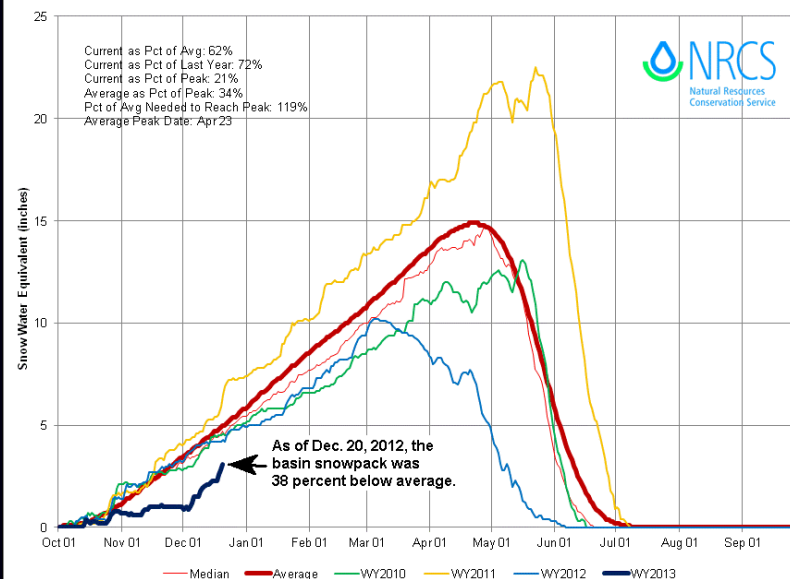
Laramie and North Platte River Basins Time Series Snowpack Summary

Based on Provisional SNOTEL data as of Dec 20, 2012



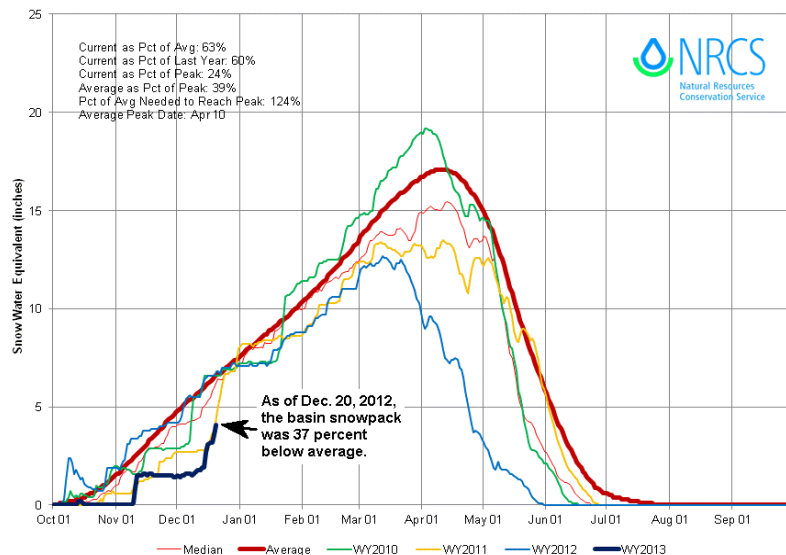
South Platte River Basin Time Series Snowpack Summary

Based on Provisional SNOTEL data as of Dec 20, 2012



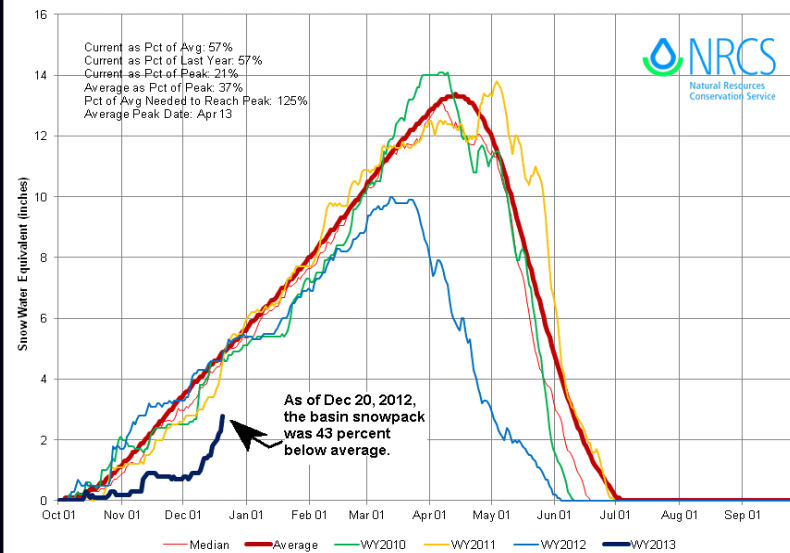
Upper Rio Grande Basin Time Series Snowpack Summary

Based on Provisional SNOTEL data as of Dec 20, 2012



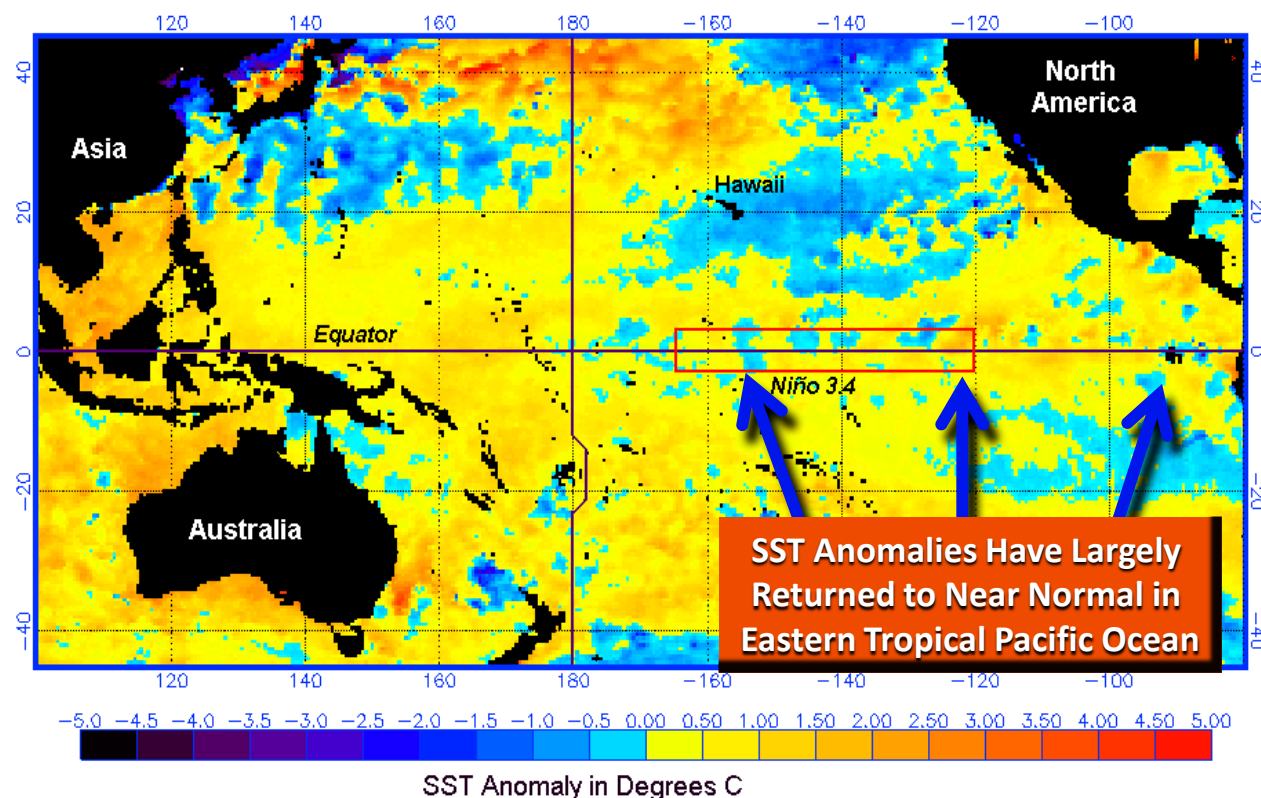
Arkansas River Basin Time Series Snowpack Summary

Based on Provisional SNOTEL data as of Dec 20, 2012



The Latest on ENSO

NOAA-NESDIS Sea Surface Temperature Anomaly (deg's C) for Dec. 20 2012



Source: NOAA's National Environmental Satellite, Data and Information Service (NESDIS)

Niño 3.4 – The principal region in the eastern Equatorial Pacific Ocean (red outlined box along the equator) used by the Climate Prediction Center (CPC) for monitoring, assessing and predicting the interseasonal climate phenomena called El Niño/Southern Oscillation (ENSO).

Slightly warmer than normal waters continue to dominate the Pacific Ocean the third week of December 2012.

However, in the past few weeks, positive sea surface temperature (SST) anomalies in the eastern tropical Pacific Ocean region known as Niño 3.4 have weakened (cooled), and in some areas, have become negative in value (colder than average).

The Oceanic Niño Index (ONI) for Niño 3.4

Year	DJF	JFM	FMA	MAM	AMJ	MJJ	JJA	JAS	ASO	SON	OND	NDJ
2000	-1.7	-1.5	-1.1	-0.9	-0.8	-0.7	-0.6	-0.5	-0.5	-0.6	-0.8	-0.8
2001	-0.7	-0.6	-0.5	-0.3	-0.2	-0.1	0.0	0.0	-0.1	-0.2	-0.2	-0.3
2002	-0.2	0.0	0.1	0.3	0.5	0.7	0.8	0.8	0.9	1.2	1.3	1.3
2003	1.1	0.8	0.4	0.0	-0.2	-0.1	0.2	0.4	0.4	0.4	0.4	0.3
2004	0.3	0.2	0.1	0.1	0.1	0.3	0.5	0.7	0.7	0.7	0.7	0.7
2005	0.6	0.4	0.3	0.3	0.3	0.3	0.2	0.1	0.0	-0.2	-0.5	-0.8
2006	-0.9	-0.7	-0.5	-0.3	0.0	0.1	0.2	0.3	0.5	0.8	1.0	1.0
2007	0.7	0.3	-0.1	-0.2	-0.3	-0.3	-0.3	-0.6	-0.9	-1.1	-1.2	-1.4
2008	-1.5	-1.5	-1.2	-0.9	-0.7	-0.5	-0.3	-0.2	-0.1	-0.2	-0.4	-0.7
2009	-0.9	-0.8	-0.6	-0.2	0.1	0.4	0.5	0.6	0.7	1.0	1.4	1.6
2010	1.6	1.4	1.1	0.7	0.2	-0.3	-0.8	-1.2	-1.4	-1.5	-1.5	-1.5
2011	-1.4	-1.3	-1.0	-0.7	-0.4	-0.2	-0.2	-0.3	-0.6	-0.8	-1.0	-1.0
2012	-0.9	-0.7	-0.5	-0.3	-0.1	0.0	0.1	0.3	0.4	0.6		

NOAA/CPC Last Update 12-05-12

The ONI for the latest complete 3-month climate season (September-November) was +0.6; an increase of +0.2 from the previous overlapping 3-month season ASO.

El Niño : ONI higher than +0.45
Neutral ENSO : ONI of -0.45 to +0.45
La Niña: ONI lower than -0.45

The ONI is based on sea surface temperature (SST) departures from average in the Niño 3.4 region of the eastern tropical Pacific Ocean. It is the principal measure used by NOAA's Climate Prediction Center (CPC) for monitoring, assessing and predicting El Niño/Southern Oscillation (ENSO.)

ONI is defined as the three-month running mean SST departure in the Niño 3.4 region of the Pacific.

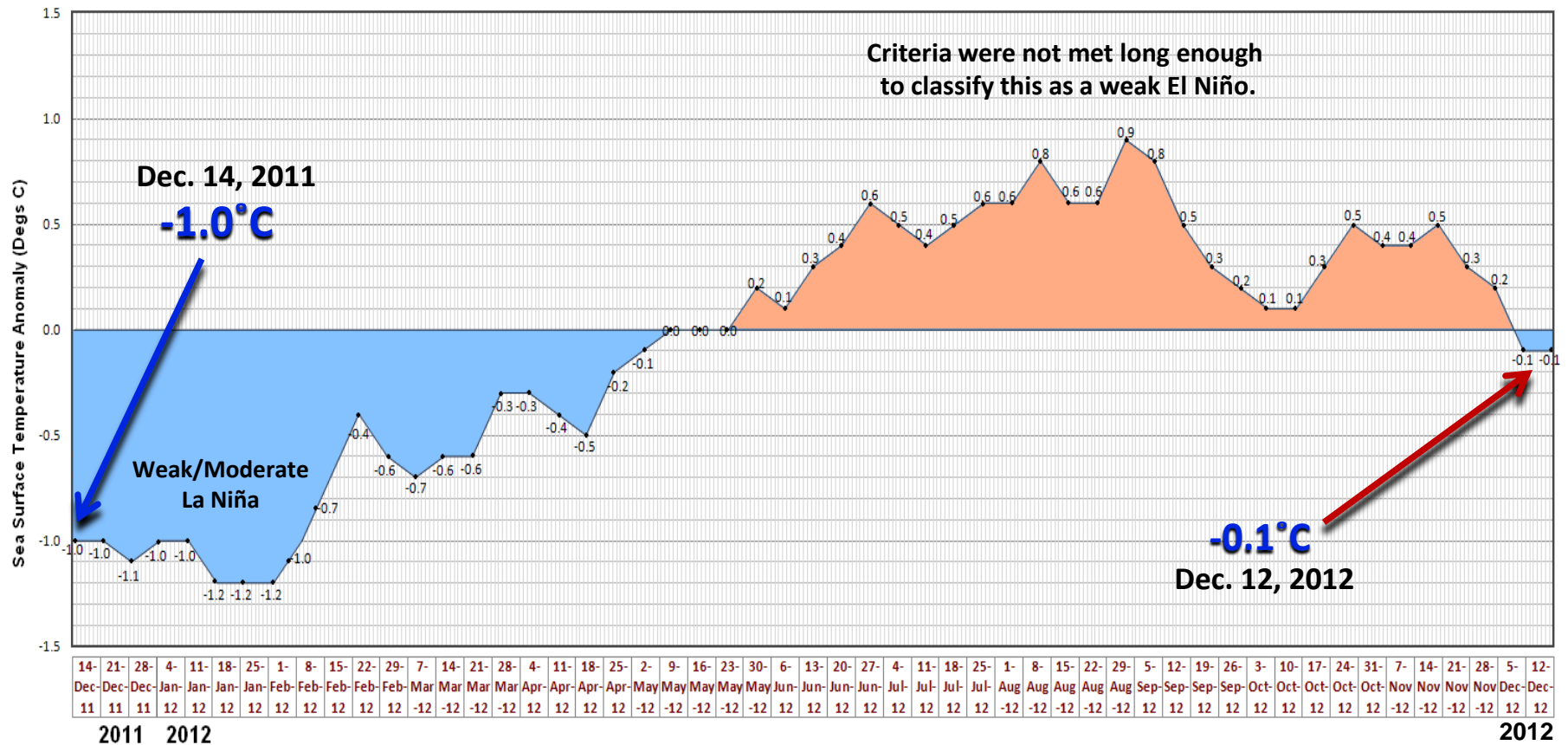
ONI is used to place current ENSO and non-ENSO events into a historical perspective.

CPC's operational definitions of El Niño and La Niña are keyed to the ONI index.

For historical purposes, warm and cold phases of ENSO (the red and blue colored numbers) are defined when the threshold is met for a **minimum of 5 consecutive overlapping 3-month seasons.**

Weekly Sea Surface Temperature Anomalies for Niño 3.4

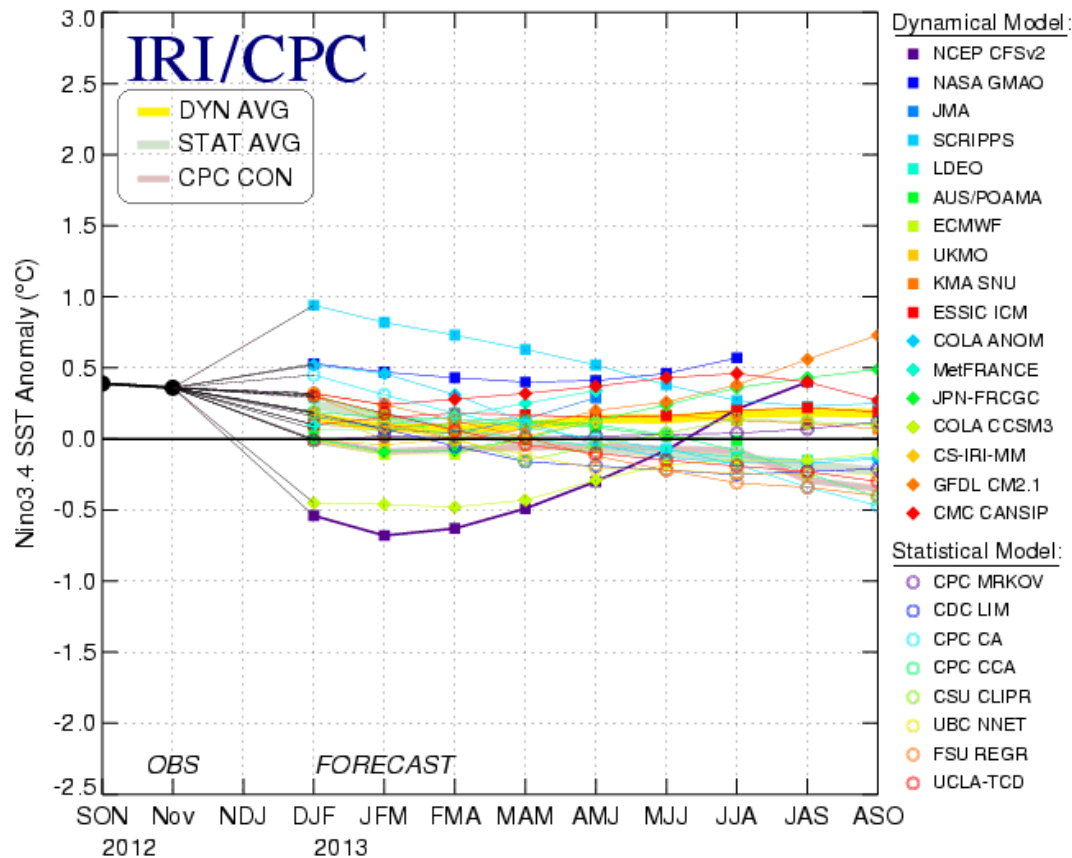
December 14, 2011 to December 12, 2012



Source: NOAA - Climate Prediction Center

The weekly SST anomaly for ENSO 3.4 has trended negative (-0.1°C) since the start of December 2012, after being in positive territory since late May of 2012.

Mid-Dec 2012 Plume of Model ENSO Predictions



Forecast SST Anomalies (deg C) for the Eastern Pacific Region Niño 3.4

Seasons (2012-2013)	DJF	JFM	FMA	MAM	AMJ	MJJ	JJA	JAS	ASO
Average, Dynamical Models	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
Average, Statistical Models	0.2	0.2	0.1	0	-0.1	-0.1	-0.1	-0.2	-0.2
Average, All Models	0.2	0.1	0.1	0.1	0.1	0	0.1	0	0

Source: The International Research Institute for Climate and Society (IRI) - Dec 20 2012

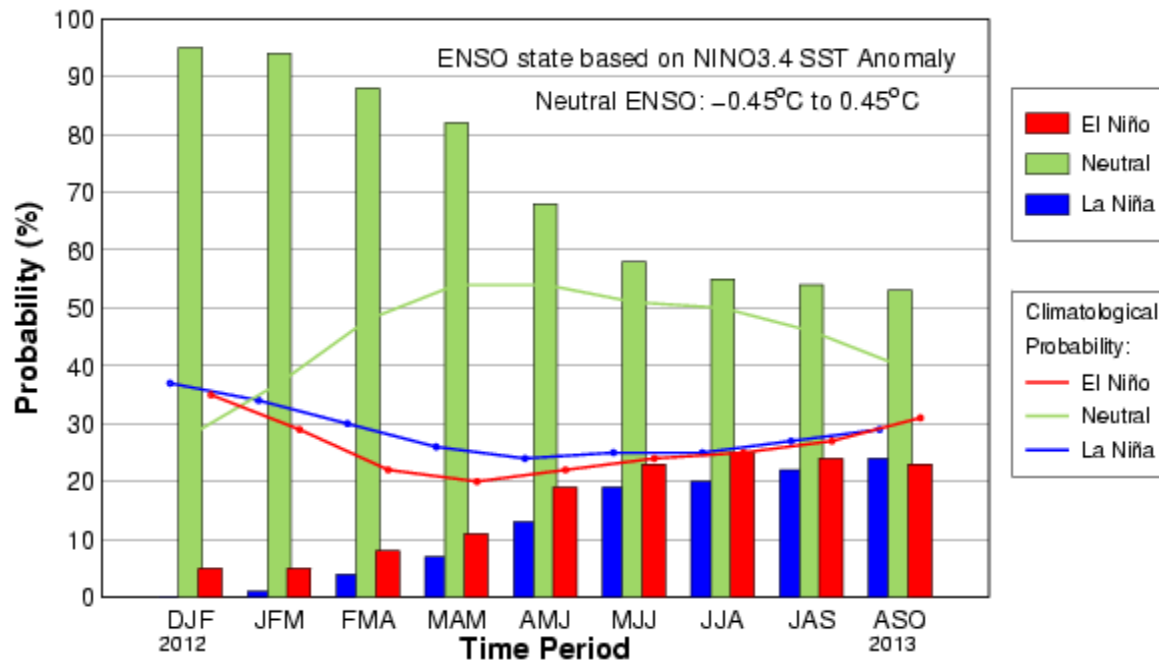
The ENSO Outlook

An overwhelming majority of the dynamical and statistical climate models predict neutral or non-ENSO conditions in the Niño 3.4 region of the Pacific Ocean through the 2013 summer season.

The table in the lower left contains the cumulative average of sea surface temperature anomalies (SSTa) forecasted by 17 dynamical models and 8 statistical models, and a cumulative average for all 25 models for overlapping 3-month climate seasons ending August-September-October of 2013.

An SSTa value less than $+0.45^{\circ}\text{C}$ and greater than -0.45°C is a strong indicator of neutral ENSO conditions.

Mid-Dec IRI/CPC Plume-Based Probabilistic ENSO Forecast



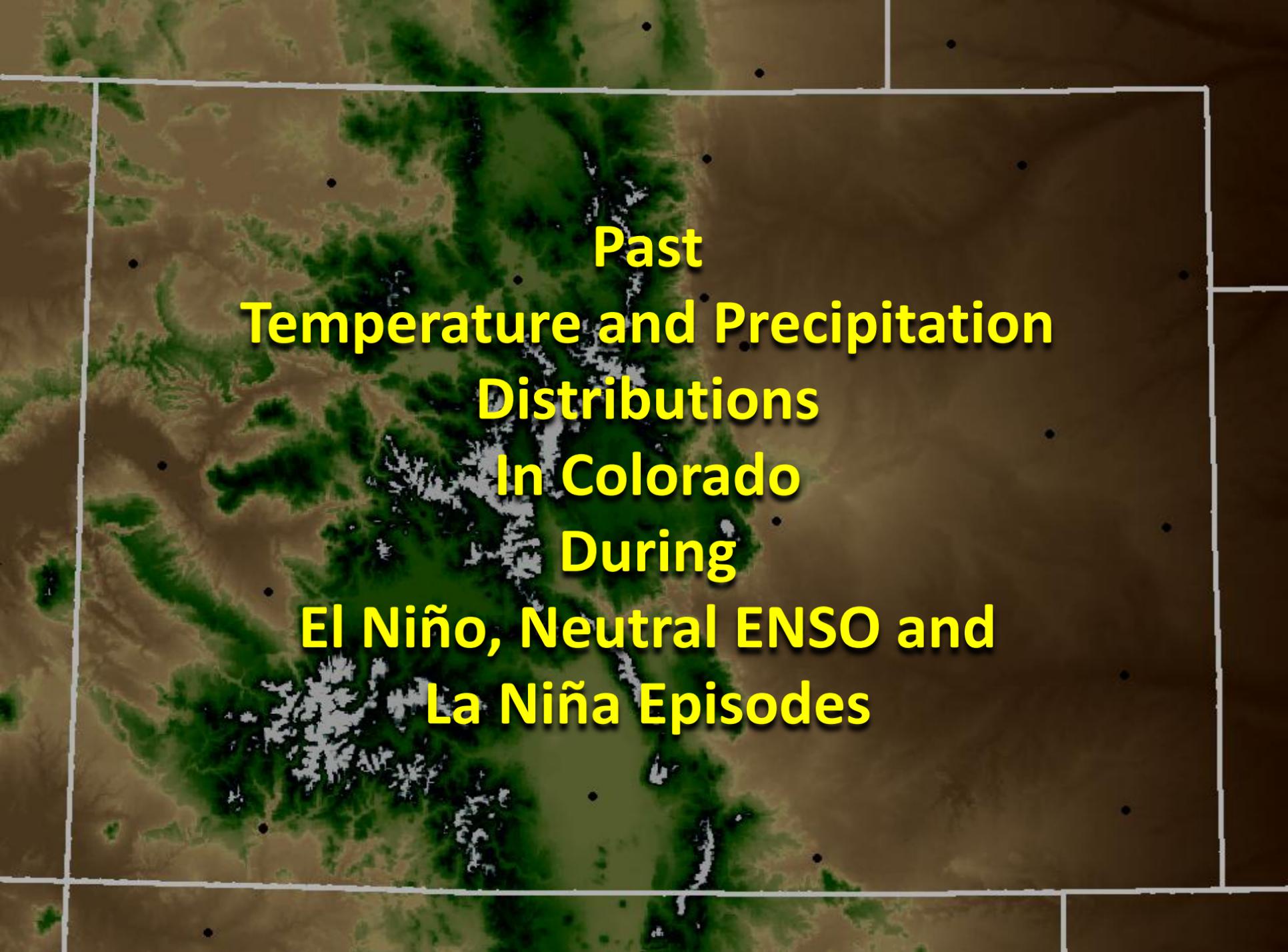
IRI Probabilistic ENSO Prediction for NINO3.4 Region

Season	La Niña	Neutral	El Niño
DJF 2012	~0%	95%	5%
JFM 2013	1%	94%	5%
FMA 2013	4%	88%	8%
MAM 2013	7%	82%	11%
AMJ 2013	13%	68%	19%
MJJ 2013	19%	58%	23%
JJA 2013	20%	55%	25%
JAS 2013	22%	54%	24%
ASO 2013	24%	53%	23%

Probabilistic ENSO Forecast for Nine Overlapping 3-Month Climate Seasons Out Through August-October 2013

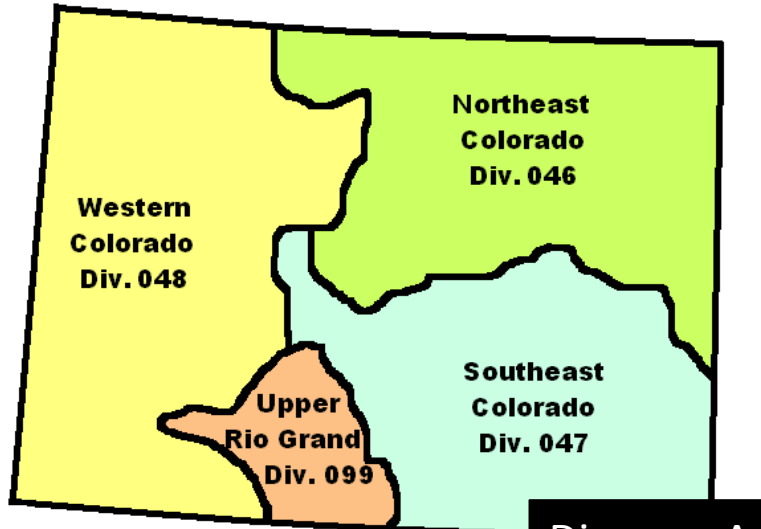
So, what weather patterns might we see across Colorado during the next few months with neutral ENSO conditions in the Pacific Ocean?

The following slides offer a reasonable answer to this question.

A topographic map of Colorado is shown in the background. The map uses a color gradient where green represents lower elevations and brown/tan represents higher elevations. The state's outline is visible, and the text is centered over the mountainous region.

**Past
Temperature and Precipitation
Distributions
In Colorado
During
El Niño, Neutral ENSO and
La Niña Episodes**

Colorado Climate Divisions



NOAA/Climate Prediction Center

Diagram A

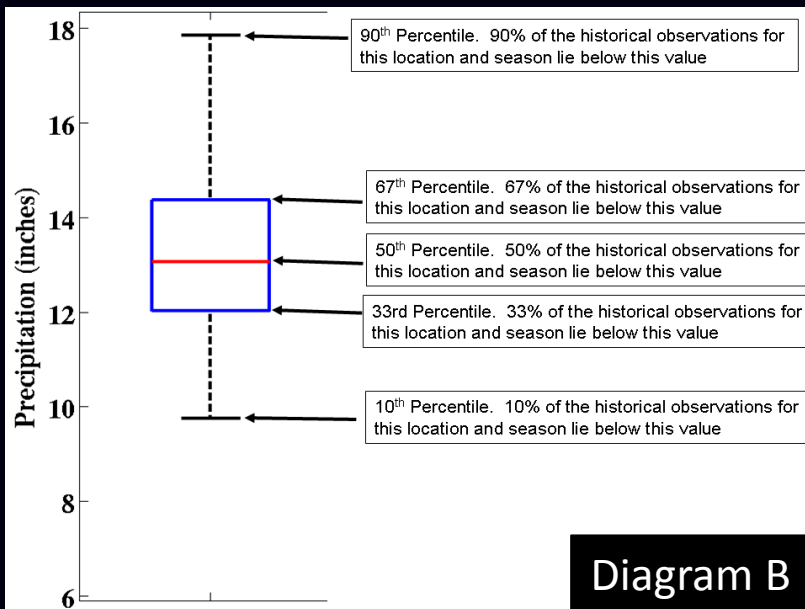


Diagram B

Interpreting ENSO Box and Whisker Plots

Diagram A is a map of the four climate mega-divisions in Colorado used by the Climate Prediction Center (CPC)—Divisions 046, 047, 048 and 099.

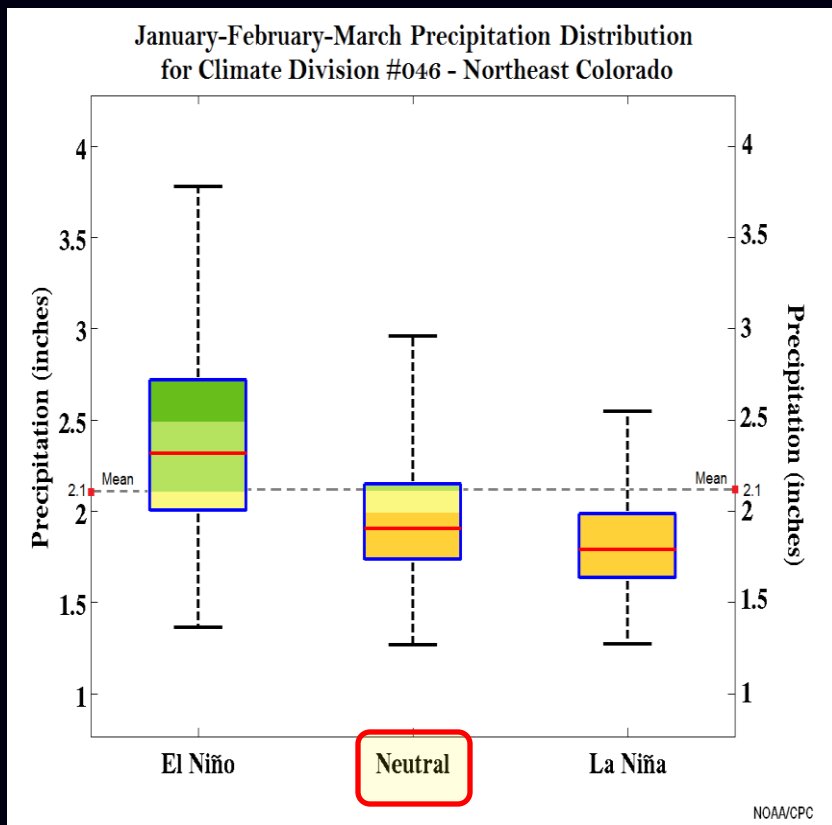
CPC has produced 3-month historical temperature and precipitation distribution plots for the three different ENSO categories—El Niño, La Niña and ENSO-neutral (non-ENSO) conditions for every climate mega-division in the United States.

Diagram B is a description of the ENSO box and whisker analysis plot used by CPC to represent historical temperature and precipitation distributions for each ENSO category pertaining to each climate division.

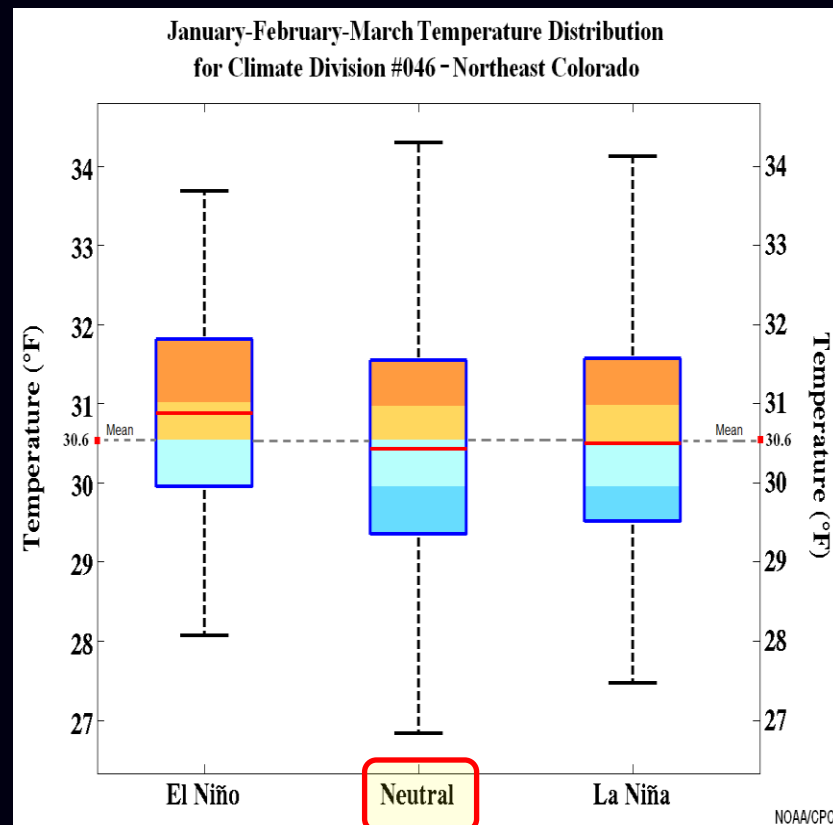
The red line inside the ENSO box represents the mean or 50th percentile of the data (temperature or precipitation) distribution for each climate division. Approximately 34% of the total observations exist within the ENSO box, and the remaining observations (about 66%) lie outside of the box along the whiskers extending above and below the box.

It should be pointed out that the following temperature and precipitation distributions do not differentiate between El Niño and La Niña events of weak, moderate and strong intensity.

Precipitation and Temperature Composites (ENSO Box and Whisker Analysis Plots) for the Northeast Colorado Climate Division #046 for January-March

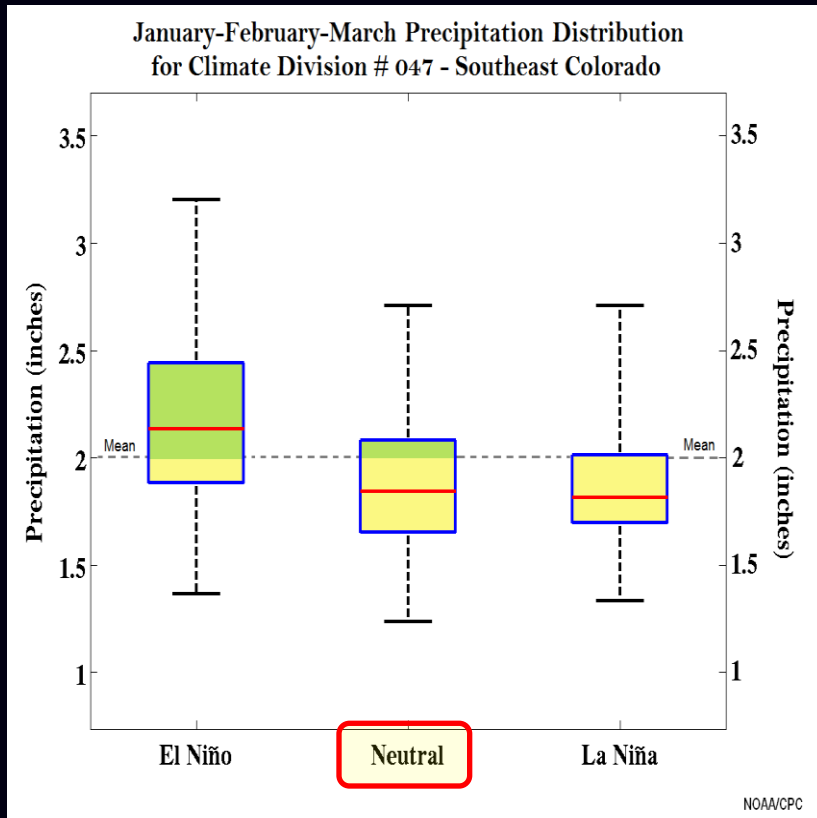


Precipitation in northeast Colorado during January through March have historically been **near to below average during neutral or non-ENSO conditions**, above average during El Niño events, and below average during La Niña episodes.

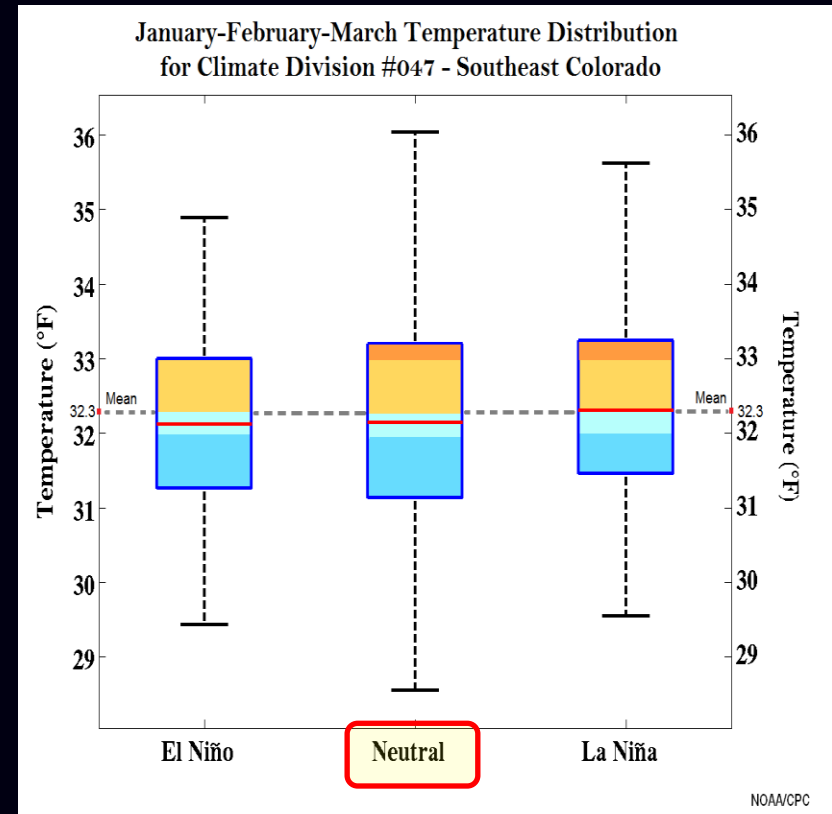


For the same three month period, temperatures were **near average during neutral conditions** and La Niña events, and near to above average during El Niño episodes.

Precipitation and Temperature Composites (ENSO Box and Whisker Analysis Plots) for the Southeast Colorado Climate Division #047 for January-March

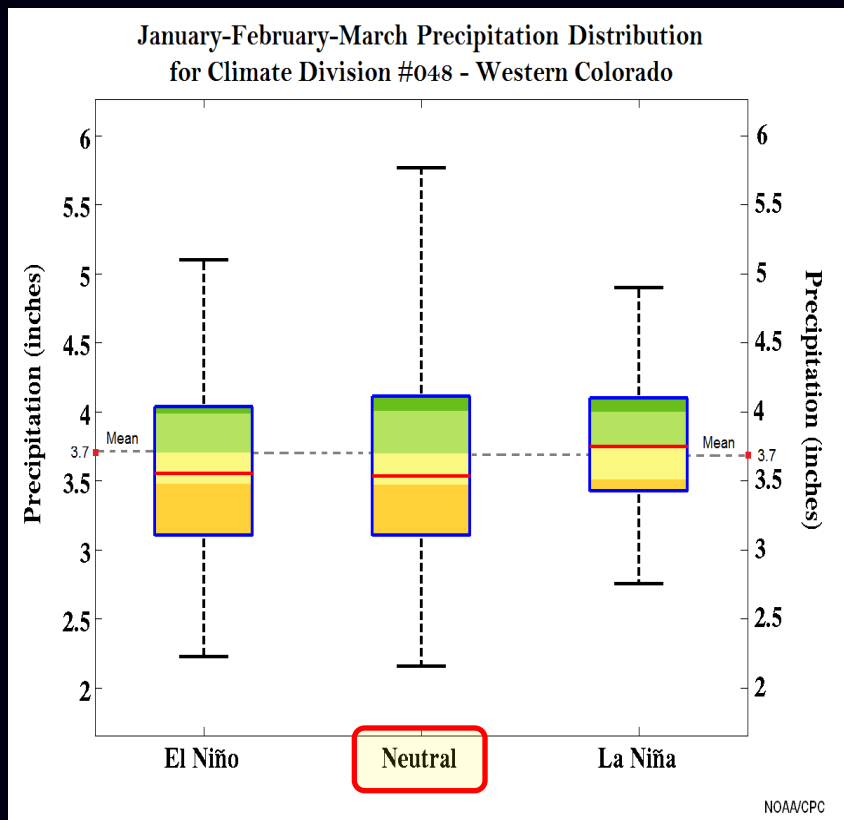


Precipitation in southeast Colorado during the climate season January through March has historically been **near to below average during neutral conditions** and La Niña periods, and near to above average during El Niño events.

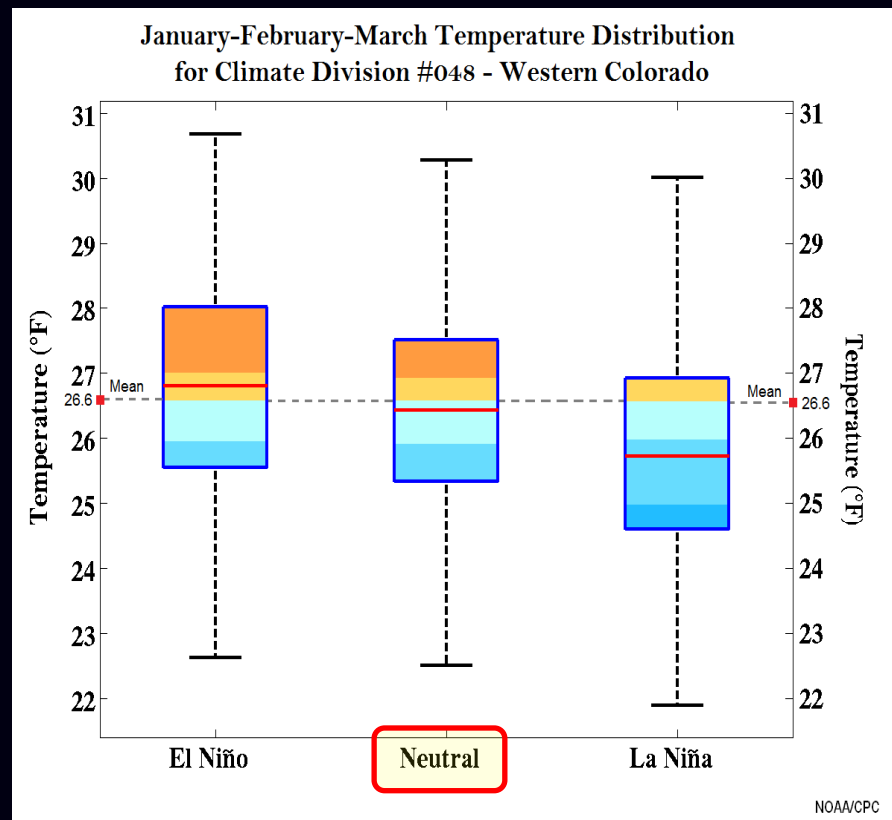


For the same time period, temperatures were **near average during neutral ENSO**, El Niño and La Niña cycles.

Precipitation and Temperature Composites (ENSO Box and Whisker Analysis Plots) for the Western Colorado Climate Division #048 for January-March



Precipitation across western Colorado was generally **near to slightly below average during neutral** and El Niño episodes, and near average during La Niña events.



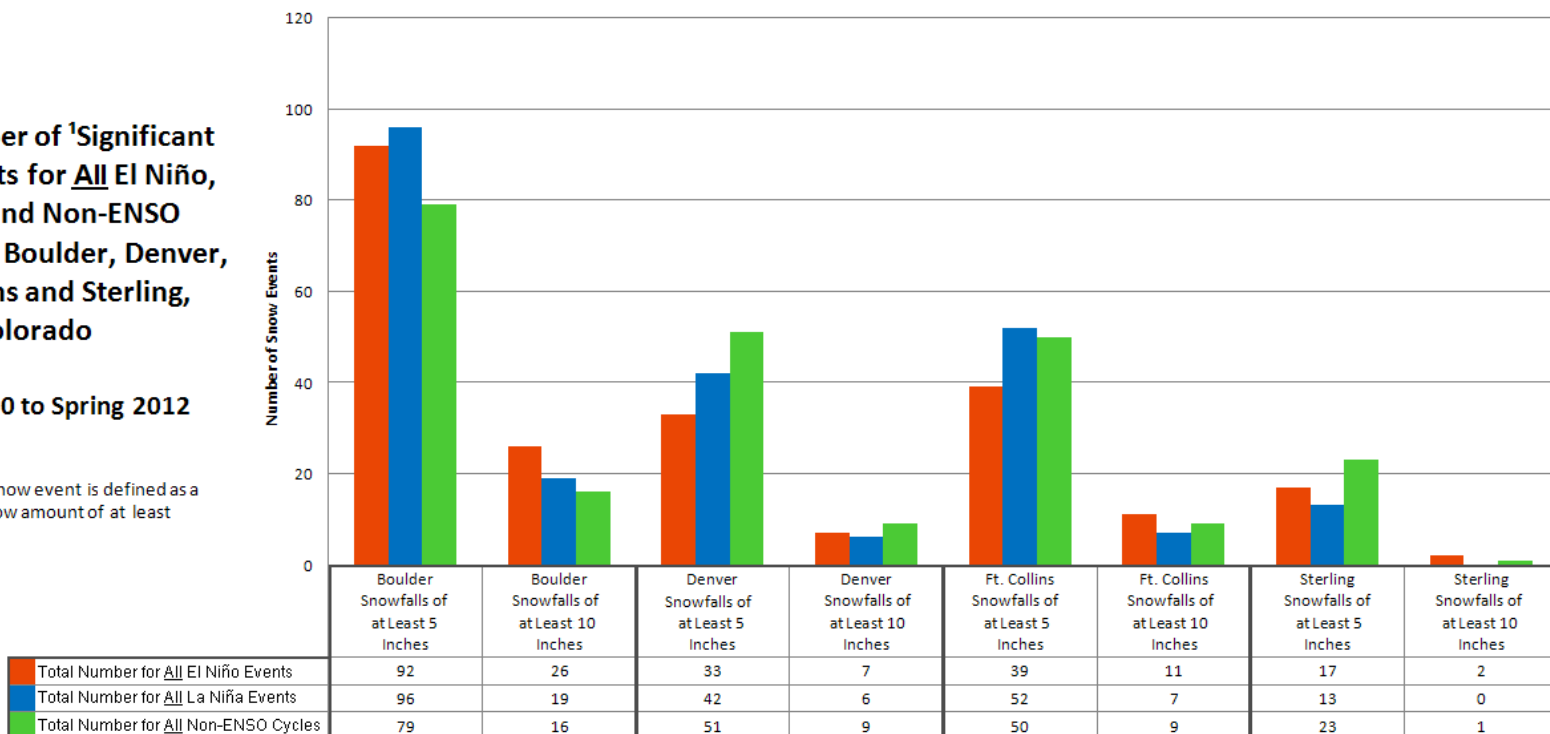
Finally, temperatures during past January through March periods were **near average during neutral ENSO conditions**, near to slightly above average during El Niños, and below average during La Niña episodes.

Prospects For Significant Snowfall in Northeast Colorado This Winter

Total Number of ¹Significant Snow Events for All El Niño, La Niña and Non-ENSO Episodes for Boulder, Denver, Fort Collins and Sterling, Colorado

Fall 1950 to Spring 2012

¹A significant snow event is defined as a storm total snow amount of at least 5 inches.



Baker NWS Boulder

A majority of the 5 plus inch snowfall events in Boulder and Fort Collins happened during La Niña episodes. Denver and Sterling saw most of their 5 plus inch snowfalls during non-ENSO or neutral cycles.

A majority of the 10 plus inch snowfalls in Boulder, Fort Collins and Sterling occurred during El Niño events. While Denver saw a small majority of its 10 plus inch snowfalls during non-ENSO periods.

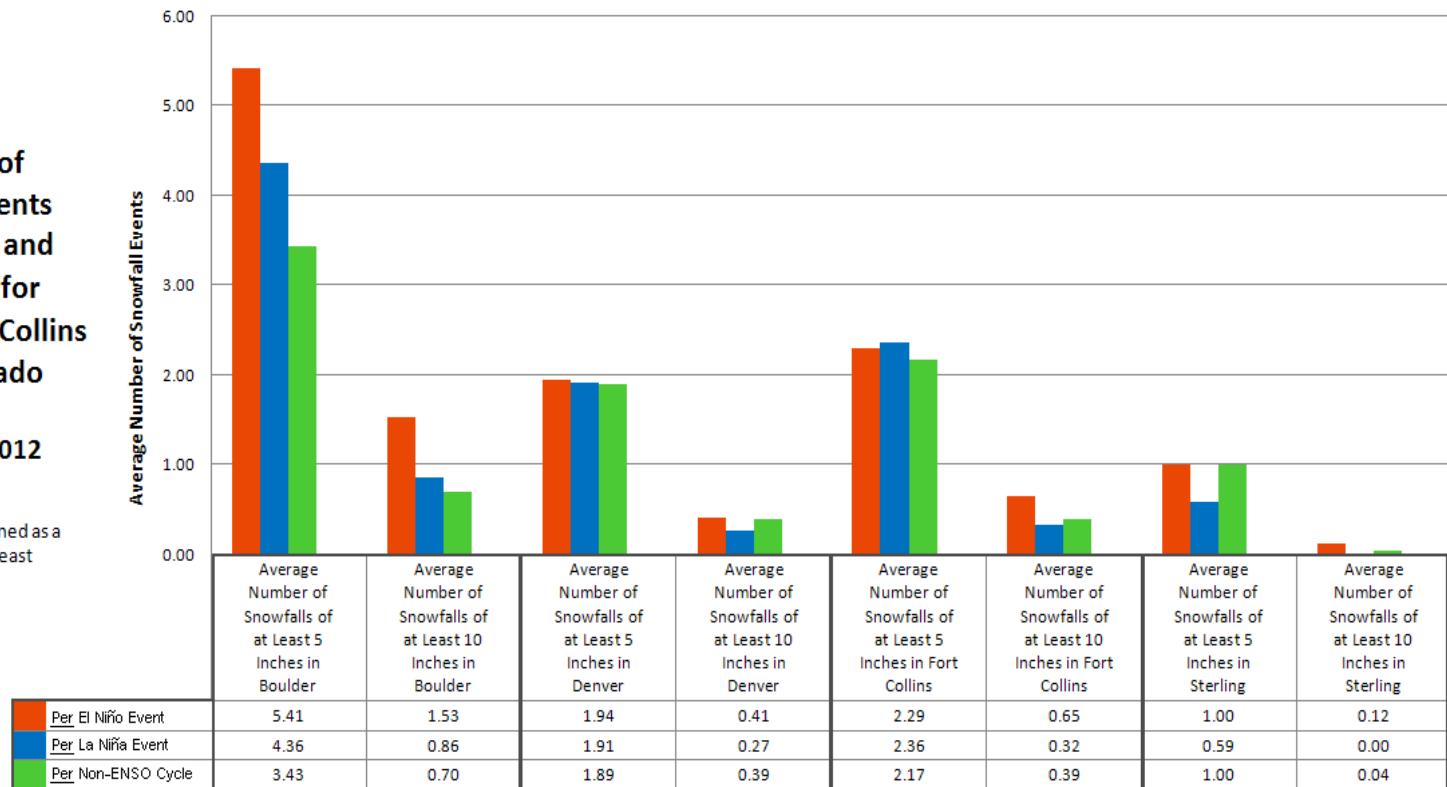


Baker - National Weather Service Boulder, Colorado

Average Number of ¹Significant Snow Events Per El Niño, La Niña and Non-ENSO Episode for Boulder, Denver, Fort Collins and Sterling, Colorado

Fall 1950 to Spring 2012

¹A significant snow event is defined as a storm total snow amount of at least 5 inches.



Baker NWS Boulder

The *average number* of ¹significant snow events *per* ENSO and non-ENSO episode are referenced above for Boulder, Denver, Fort Collins and Sterling. These values may better indicate the connection between significant snowfall and ENSO/non-ENSO periods for these locations.

Overall, Boulder saw most of its 5 plus and 10 plus snowfalls during El Niño. Denver saw little difference in the number of 5 plus and 10 plus inch snowfalls observed during El Niño, La Niña and non-ENSO episodes. Fort Collins averaged its greatest number of 5 plus inch snowfall during La Niña, and averaged its greatest number of 10 plus inch snowfalls during El Niño events. Finally, 5 plus inch snowfalls in Sterling were evenly split between El Niño and non-ENSO periods, while the number of 10 plus inch snowfalls in Sterling was too small to be considered relevant.



**January-February-March
2013**

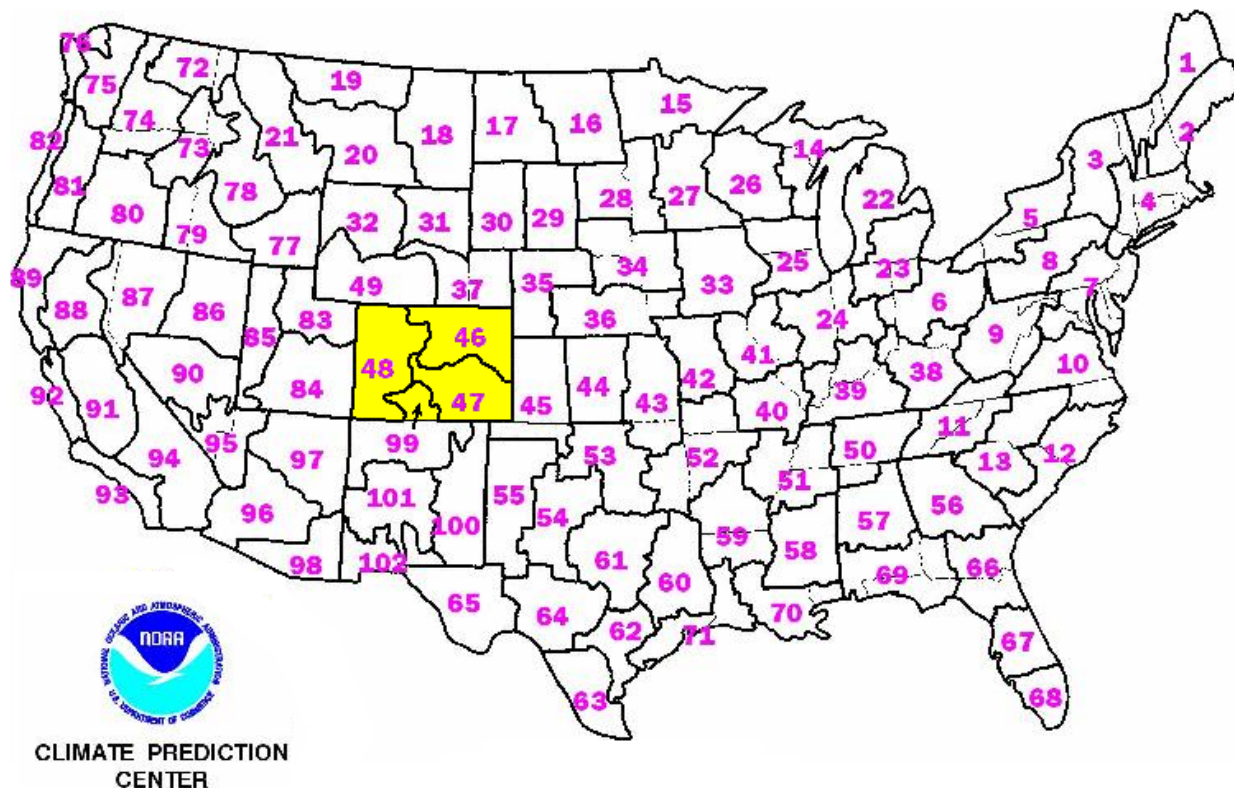
**Temperature and Precipitation
Outlooks for Colorado
Issued by the
Climate Prediction Center**

Climate Prediction Center Seasonal Outlooks

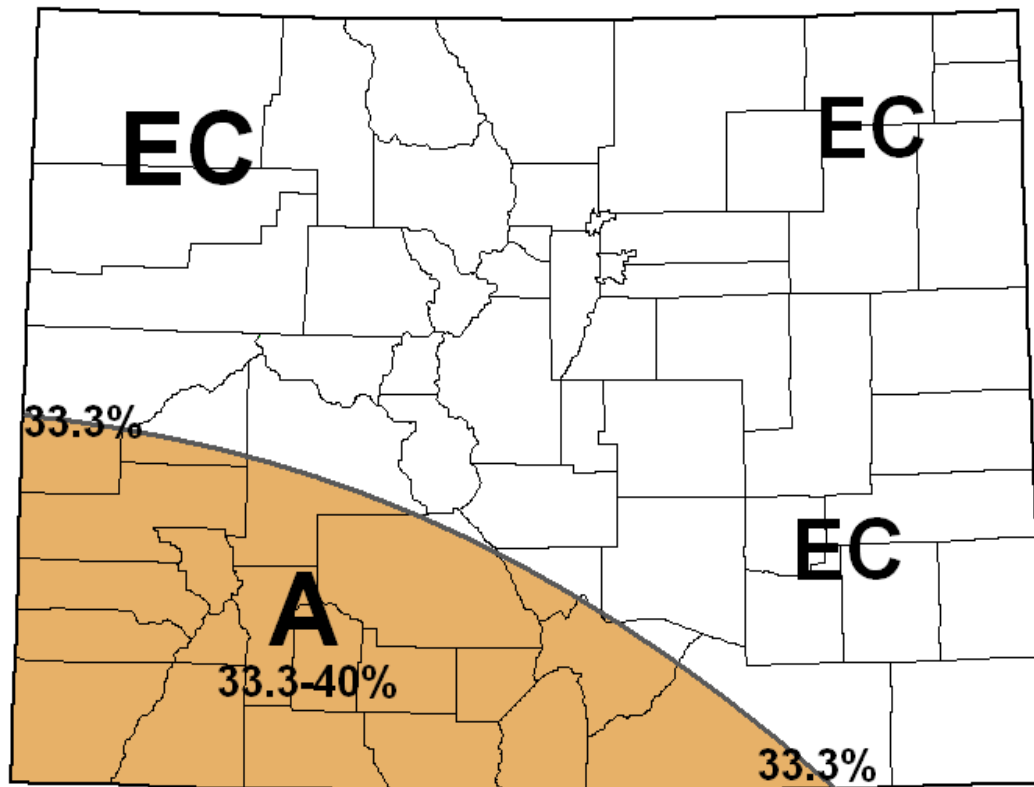
The National Weather Service Seasonal Climate Outlooks predict the probability of conditions being among the warmest/coldest or wettest/driest terciles of years compared to the period of record 1981-2010.

The outlooks indicate probability of being in three specific categories in reference to the 30-year climatology from 1981-2010. They are above, below and average.

Remember, Climate Prediction Center (CPC) outlooks are made at the scale of the climate megadivisions (see the map below).



January 2013 Temperature Outlook for Colorado



One-Month Outlook
Temperature Probability
0.5 Month Lead
Valid January 2013
Made: 20 December 2012

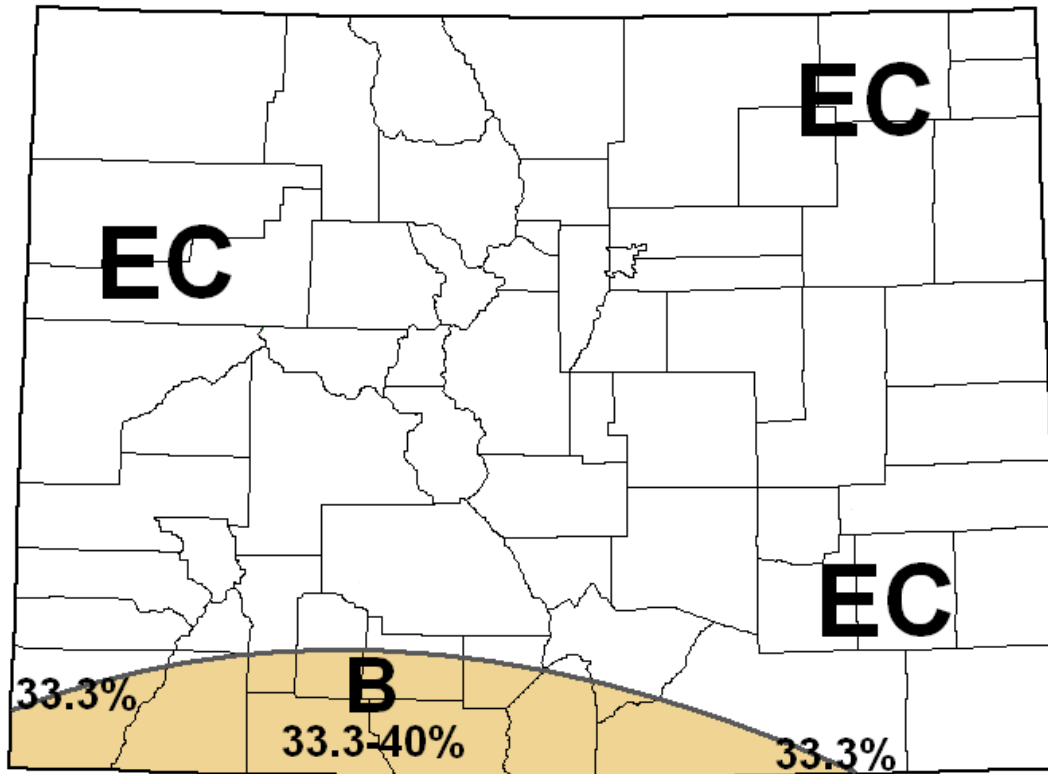
A Means Above Normal (Average)
N Means Normal (Average)
B Means Below Normal (Average)
EC Means Equal (or Undetermined)
Chances for A, N and B

Source: NOAA/Climate Prediction Center

January 2013 Temperature Outlook for Colorado

NOAA's Climate Prediction Center (CPC) is predicting a 33.3 to 40 percent chance of above average temperature across the southwest corner of Colorado, and an equal or undeterminable chance (EC) for above, below and near average temperature for the remainder of Colorado during January 2013.

January 2013 Precipitation Outlook for Colorado



One-Month Outlook
Precipitation Probability
0.5 Month Lead
Valid January 2013
Made: 20 December 2012

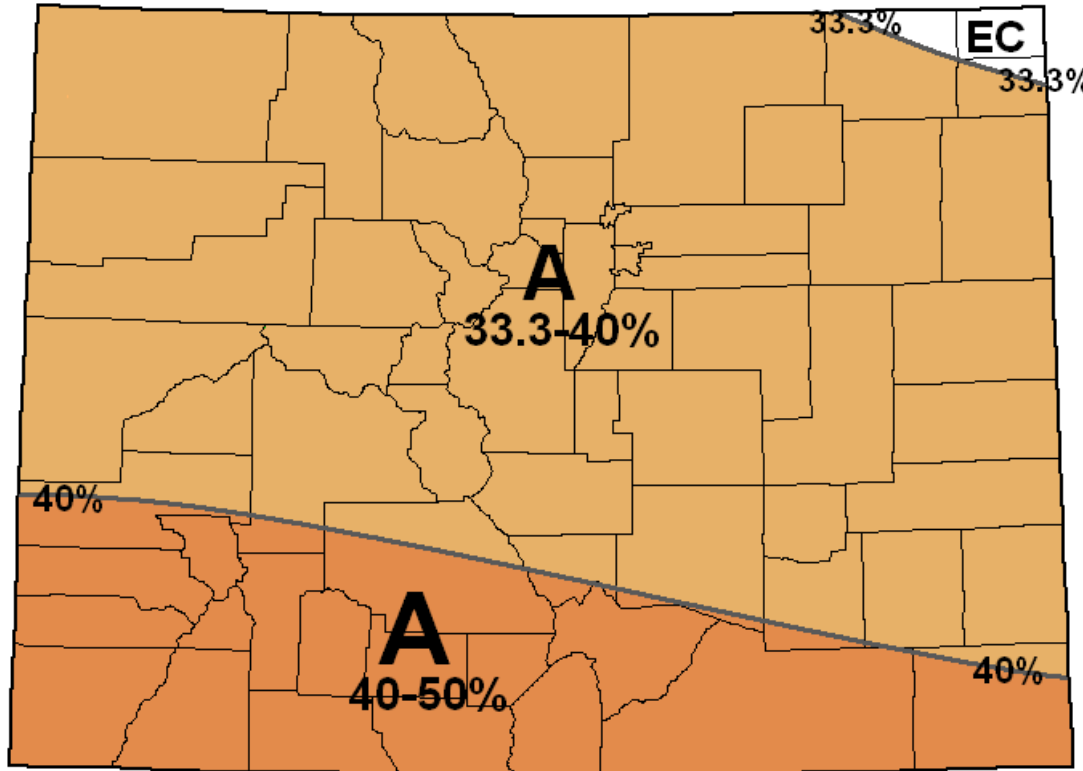
A Means Above Normal (Average)
N Means Normal (Average)
B Means Below Normal (Average)
EC Means Equal (or Undetermined)
Chances for A, N and B

Source: NOAA/Climate Prediction Center

January 2013 Precipitation Outlook for Colorado

CPC is calling for an equal or undeterminable chance (EC) for above, below and near average precipitation for all of Colorado during January 2013, except for the far southwest border region of the state where there is a 33.3 to 40 percent chance of below average precipitation.

January-February-March 2013 Temperature Outlook for Colorado



Three-Month Outlook
Temperature Probability
0.5 Month Lead
Valid JFM 2013
Made: 20 December 2012

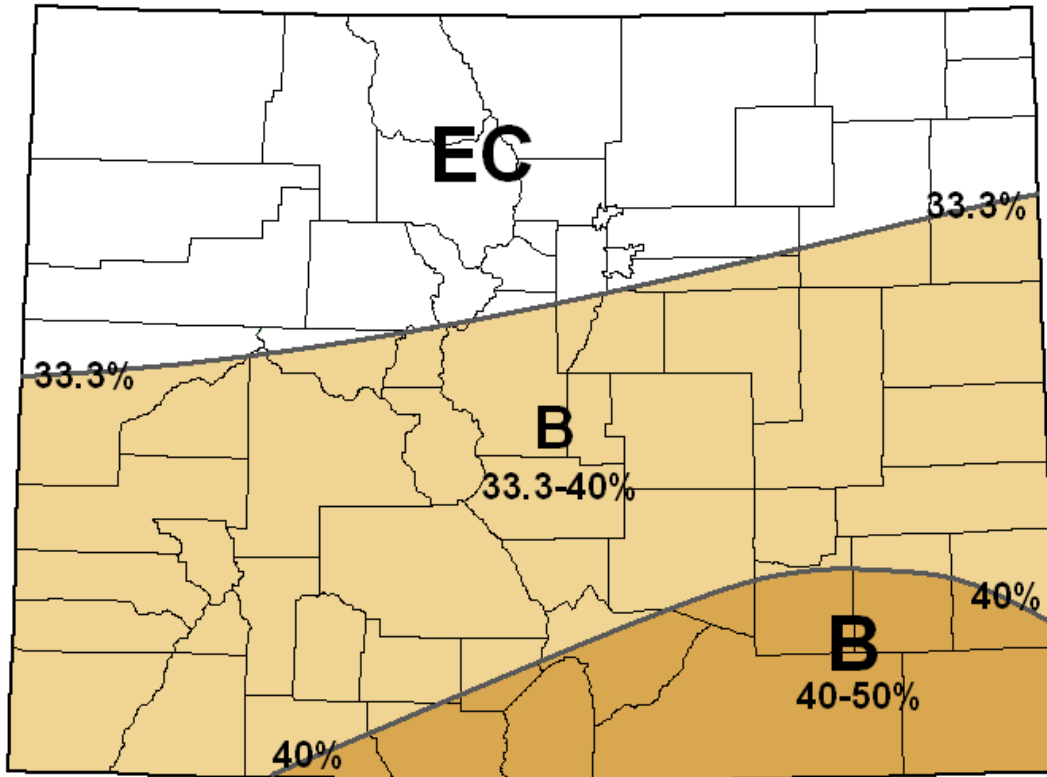
A Means Above Normal (Average)
N Means Normal (Average)
B Means Below Normal (Average)
EC Means Equal (or Undetermined)
Chances for A, N and B

Source: NOAA/Climate Prediction Center

January-March 2013 Temperature Outlook for Colorado

For the climate season January through March of 2013, CPC is calling for a 40 to 50 percent chance of above average temperature across roughly the southern one-fourth of Colorado, and except for a small area of EC in the far northeast corner, there is a 33.3 to 40 percent chance of above average temperature for the remainder of Colorado.

January-February-March 2013 Precipitation Outlook for Colorado



Three-Month Outlook
Precipitation Probability
0.5 Month Lead
Valid JFM 2013
Made: 20 December 2012

A Means Above Normal (Average)
N Means Normal (Average)
B Means Below Normal (Average)
EC Means Equal (or Undetermined)
Chances for A, N and B

Source: NOAA/Climate Prediction Center

January-March 2012 Precipitation Outlook for Colorado

The precipitation outlook for this three month period calls for a 40 to 50 percent chance of below average precipitation across the southeast corner of Colorado and a 33.3 to 40 percent chance of below average precipitation central portions of the state. The latest outlook is also calling for an equal or undeterminable chance (EC) of above, below and near average precipitation for the northern third of Colorado.

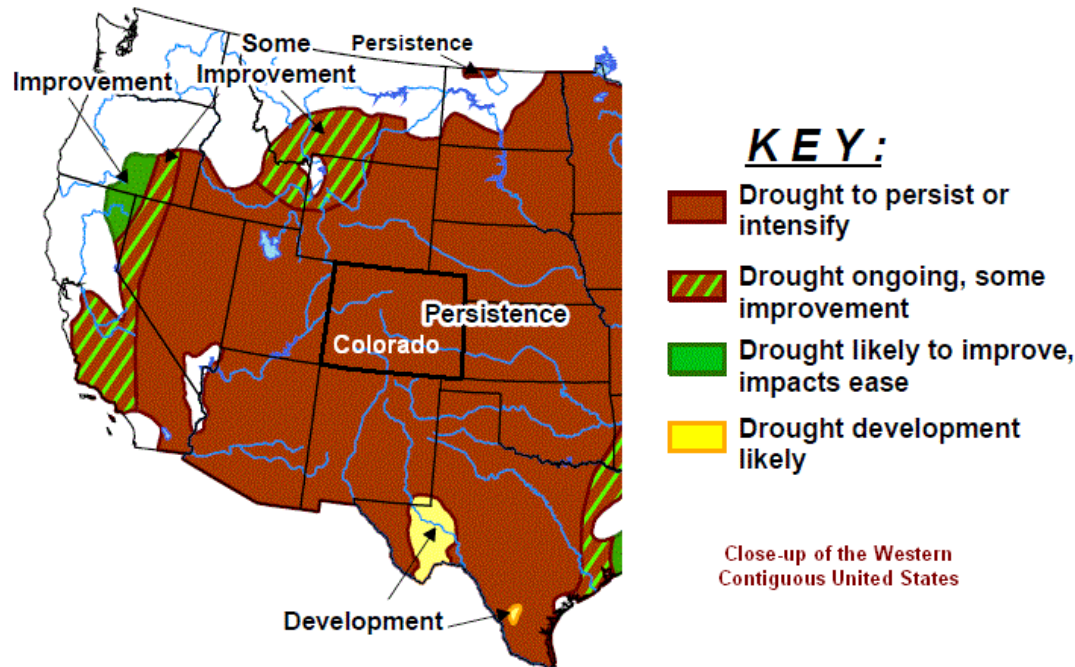


U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Valid for December 20, 2012 - March 31, 2013

Released December 20, 2012



KEY:

- Drought to persist or intensify
- Drought ongoing, some improvement
- Drought likely to improve, impacts ease
- Drought development likely

Close-up of the Western
Contiguous United States

Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Short-term events -- such as individual storms -- cannot be accurately forecast more than a few days in advance. Use caution for applications -- such as crops -- that can be affected by such events. "Ongoing" drought areas are approximated from the Drought Monitor (D1 to D4 intensity). For weekly drought updates, see the latest U.S. Drought Monitor. NOTE: the green improvement areas imply at least a 1-category improvement in the Drought Monitor intensity levels, but do not necessarily imply drought elimination.

Finally, the latest seasonal drought outlook for the period valid from December 20, 2012 to March 31, 2013 calls for drought conditions to continue and possibly intensify across nearly all in the western United States, including Colorado.

For an outlook for the entire U.S., go to www.cpc.ncep.noaa.gov/products/expert_assessment/season_drought.gif.

Summing It Up

- Precipitation varied widely across Colorado during October and November. Monthly totals ranged from much below average in parts of southern and eastern Colorado, to much above average in portions of northwest and south central Colorado. During the same time period, the snowpack in Colorado ran below to much below average, with the Arkansas River Basin in southeast Colorado having the lowest average snowpack in the state.
- During December, a series of Pacific storm systems helped to relieve the snow drought for portions of southwest, south central and northwest Colorado. However, the statewide average snowpack remained below average (68 percent of average). Temperatures in Colorado for the same three month period were generally above average, and in some areas, as much as 10 degrees (F) above average. Northern Colorado saw the greatest positive temperature anomalies. The lack of precipitation and the unseasonably warm temperatures this fall continued to reduce soil moistures which further enhanced the ongoing drought in Colorado.
- An overwhelming majority of the ENSO-climate prediction models indicate neutral ENSO (non-ENSO) conditions in the Pacific Ocean through at least the summer of 2013.

- During previous neutral ENSO cycles, Colorado generally experienced near to above average temperatures and near to below average precipitation. No one part of the state laid claim to a persistent storm track pattern during neutral ENSO periods as often happens during El Niño and La Niña cycles. During a neutral winter, one storm may bring heavy snow and strong winds to southwest Colorado, the next storm the same wintry mix to the mountains and high valleys of northwest and central Colorado. Eastern Colorado still saw its share of winter storms during neutral ENSO periods, although these storms were more likely to deposit the bulk of their moisture in the valleys and westward facing mountain slopes of western Colorado.
- The latest outlook for January from the Climate Prediction Center calls for a 33.3 to 40 percent chance of above average temperature and precipitation across southwest Colorado, and an equal or undeterminable chance of above, below and near average temperature and precipitation for the remainder of the state.
- The outlook for the third month climate season January through March calls for a 40 to 50 percent chance of above average temperature for the southern one-fourth of Colorado, and a 33.3 to 40 percent chance for above average temperature for the rest of the state. The precipitation outlook for this same three month period calls for a 33.3 to 40 percent chance of below average precipitation for the southeastern corner of Colorado, a 33.3 to 40 percent chance of below average precipitation for central Colorado, and equal chances of above, below and near average precipitation for the remainder of the state.
- Lastly, moderate to exceptional drought conditions in Colorado are predicted to persist through the spring of 2013.